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Master
hard-surface
sculpting
page 68

“In my experience in entertainment design, the one constant is that the client wants the design in less time and as real-looking as possible. Working in 3D makes that possible”

Jerad S Marantz offers tips, tricks and advice **Page 68**

Artist info



Jerad S Marantz

Personal portfolio site
<http://jeradsmarantz.blogspot.com>

Country USA

Software used
ZBrush, Photoshop



Jerad S Marantz has been working in the film, games and TV industries for over 15 years, after forging a career at an early age interning at special FX houses. Trying a little of everything helped him to narrow his focus on character and creature design, and we're glad he did!

This issue we learn from Jerad's incredible design senses to help us master our own hard-surface projects. Turn to page 68 to discover a few secrets from this talented Gnomon School instructor...

Welcome

to the magazine and 116 pages of amazing 3D

Every issue you can count on...

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- 2 Behind-the-scenes guides to images and fantastic artwork
- 3 A disc packed full of creative goodness
- 4 Interviews with inspirational artists
- 5 Tips for studying 3D or getting work in the industry
- 6 The chance to see your art in the mag!



Here at **3D Artist** we're suckers for robots. Quirky, dark, cute, frightening... We love them all. But we understand that it can be frustrating for those of us not yet blessed with years of industry experience to bring our dreams to life.

So if you're left pondering just how on Earth people come up with remarkable robot designs and realise them in 3D, then look no further. This issue we've aimed to unravel the mysteries of robot concept and creation with articles by top industry talents to help you master your hard-surface skills in 3ds Max, ZBrush and Maya. They'll even help you polish up your final renders in Photoshop so you can get them straight into your portfolio.

Enjoy!

Lynette

This issue's team of expert artists...



Jahirul Amin

After whetting our rigging appetites in issue 45 with the first helping of an epic Maya rigging guide, J is back to finish up



Ross Board

On his never-ending quest to learn tips and tricks to better his 3D, Ross drops by to help us improve our drab SketchUp renders



Digital-Tutors

When we teased Digital-Tutors with our robot special, the team got very excited. This issue, learn to model a robot head!



Niles Doubleday

Our 3ds Max modelling guru reveals the key to effective robot design and creation to help us build cool bots



Roald Høyer-Hansen

When Roald learned about MindTex he couldn't wait to get his hands on a potential CrazyBump rival. Will it get a thumbs up?



Christian Hecker

Our 3D and matte-painting expert Chris explores Vue 10.5 Infinite to bring us the lowdown on its tools and features



Jerad S. Marantz

Taking a breather from Hollywood and his next sci-fi masterpiece, Jerad offers us some tried-and-tested tricks



Paweł Podwojewski

Paweł risked missing a flight to Bali to bring us another instalment of arch-vis asset creation. This time, things get messy



Tomasz Strzałkowski

We've always been huge fans of Tomasz's inspired sci-fi images, so when he said yes to working with us, we got inventive...



Stanko Stupar

Our go-to After Effects genius gets busy with Video Copilot's Element 3D plug-in to give us some sound guidance



Patric Verstraete

Taking control in 3ds Max, Patric explains how he's mastered volumetric lighting effects, so we can all revel in the wonders



Sebastian Zimmermann

When Sebastian was featured in the 3D Artist gallery, we wanted more. He's back this issue with a little fashion advice

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3D Artist

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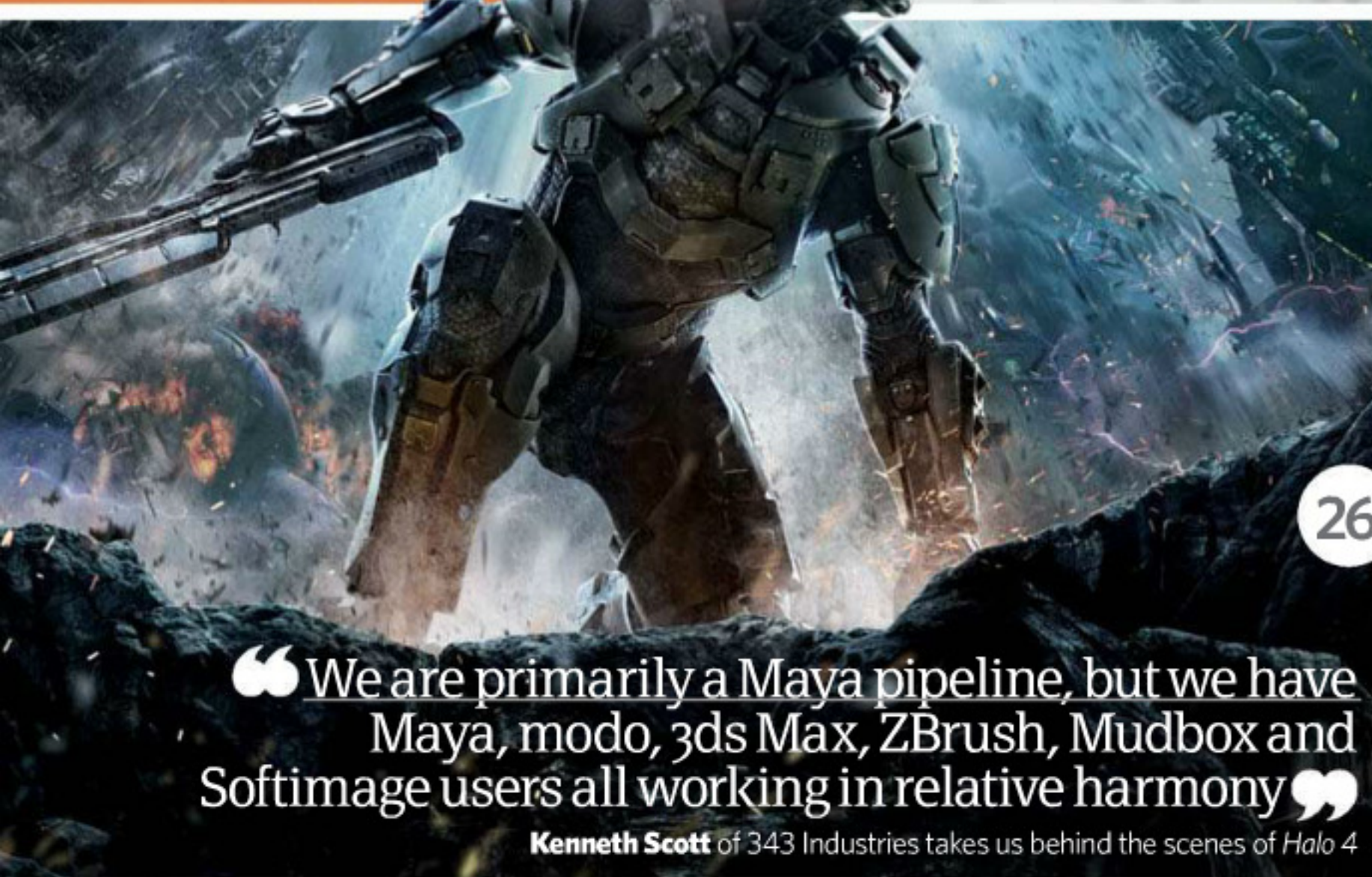
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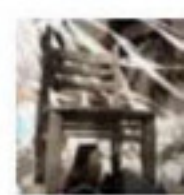
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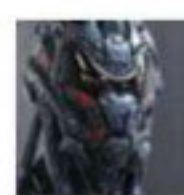
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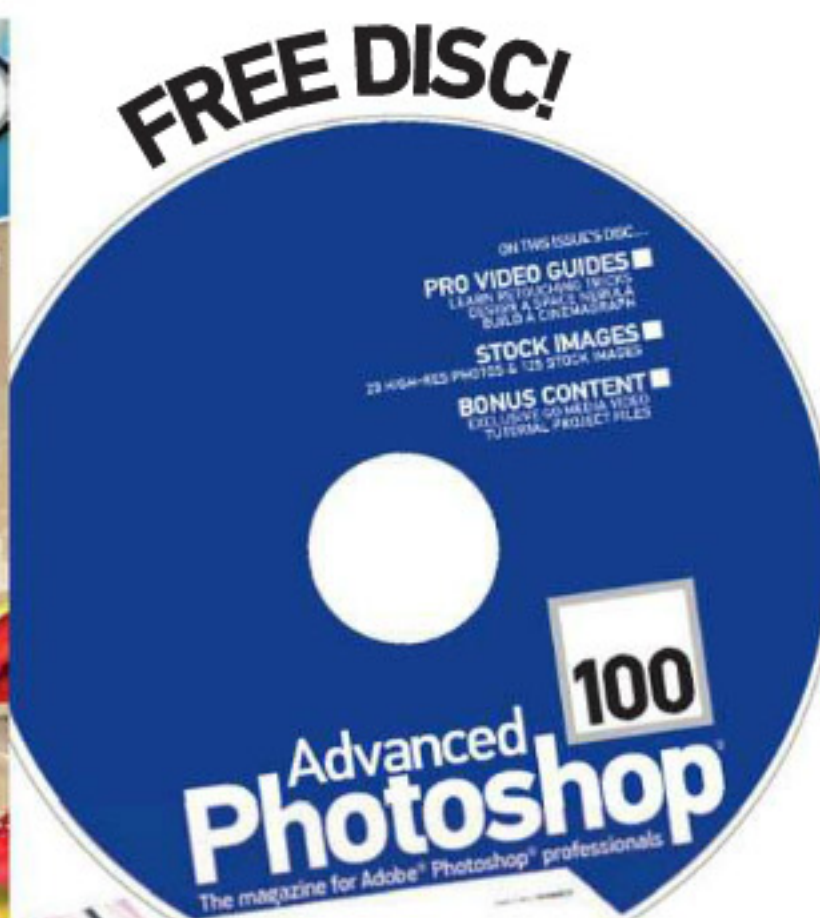
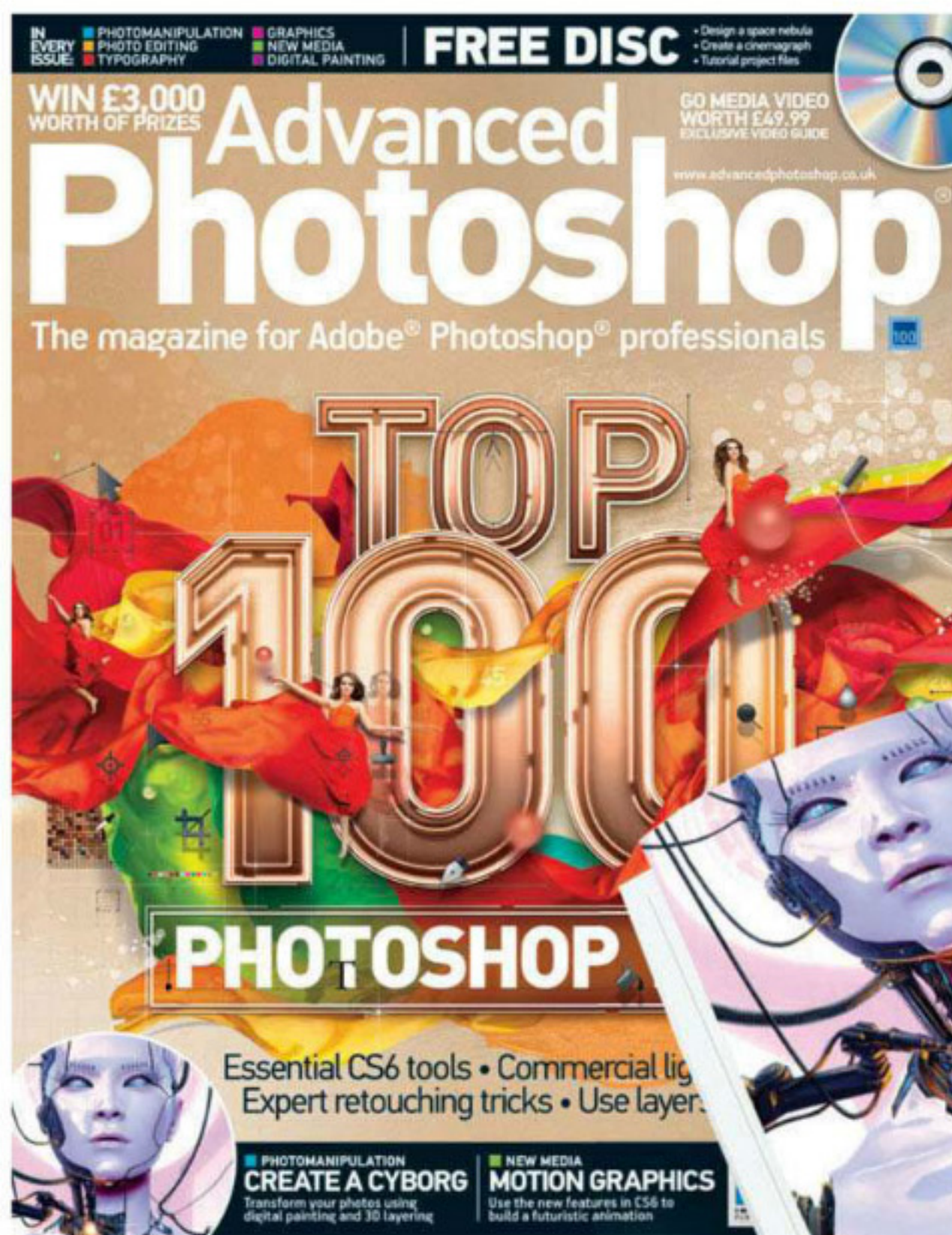
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WELCOME TO THE GALLERY

Six pages of great artwork from the 3D community *Images we love!*



Artist info



**Leonardo
Badanaís Da Silva**

Based in Sao Paulo, Brazil,
Leonardo is 28 years old and is
married with two sons

Personal portfolio site
www.badaink.blogspot.com.br

Country Brazil

Software used 3ds Max,
ZBrush, V-Ray, Photoshop

Work in progress...



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Artist info



Peyman Mokaram

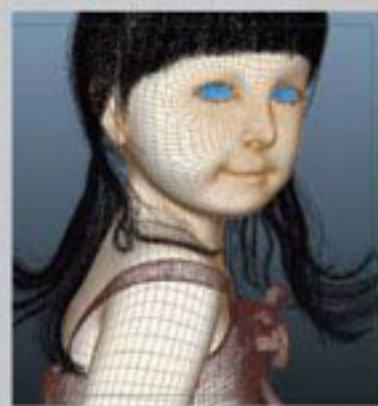
Peyman has had a passion for art since childhood and has been learning CG since 2006

Personal portfolio site
www.hit-fx.com

Country Iran

Software used Maya, mental ray, ZBrush, Photoshop

Work in progress...



The team
Loves

“ This shows how much realism can be achieved with time and effort. The hair and materials of Bonny's dress are



incredibly lifelike, but it's her eyes that are most impressive ”

Chris News Editor

“ The most difficult part of the project was the hair... I used Maya to base the model and the details were made in ZBrush. The textures were done in ZBrush and Photoshop. Lighting and rendering was done in Maya using mental ray. I also used the Shave And A Haircut plug-in ”

Peyman Mokaram, *Bonny*, 2012

The Team
LOVES

“ We love the epic scale of this scene – the luscious backdrop takes it away from the *Blade Runner* style that's so popular, to make it unique ”



Lynette Deputy Editor

Artist info



Sebastien Hue

Sebastien lives and works in Paris. He particularly enjoys concepting sci-fi scenes

Personal portfolio site
www.shue-digital.com

Country France

Software used
Vue, 3ds Max, Photoshop

Work in progress...



“ The theme here was gaia and nature. I decided to make something futuristic with a massive city and *Star Wars*-inspired spaceships – all featured in the midst of a natural background you'd often see in traditional matte painting, with mountains, trees and waterfalls ”

Sebastien Hue, *The Valley Of Gaia*, 2012

“ *The Emperor* is a project that combines 3D art with a cartoon style, using a variety of tools. Driven by a need to improve my 3D skills and influenced by Ziltoid, a music project character, this mad alien and his two-man army came to life... ”

Panagiotis Heliotis, *The Emperor*, 2012

Artist info



Panagiotis Heliotis

Panagiotis is a concept artist and illustrator. He was born in 1981 and lives in Athens

Personal portfolio site

www.panosheliotis.cghub.com

Country Greece

Software used

mudo, ZBrush, Photoshop

Work in progress...



The team
Loves

“ There’s a great deal of character to this chirpy alien chap, brought to life by some excellent lighting skills – notice the reflections on the henchmen’s helmets ”



Chris News Editor

The team
LOVES

“ We love this slick machine! The scene's simplicity really helps to show off the fantastic curves and reflective surfaces of this polished beast ”



Lynette Deputy Editor

Artist info



Simon Williamson

Simon is an associate professor at the Wentworth Institute of Technology, Massachusetts

Personal portfolio site
<http://be.net/SimonW>

Country USA

Software used
Rhino, KeyShot, Photoshop

“ My intention was to create a high-tech narrative made up of convincing details constrained by reasonable plausibility. On one level the scenario is relatively fanciful and on another it reflects the real notion that soon a group of robots will be able to organise themselves ”

Simon Williamson, *Big Sky Knife with Pak Intel Bots*, 2012

THE GALLERY

“ The gangster is a character illustrated for an advertising campaign. To connect the product [to the character we] used a roll of white paint to whiten teeth and a gun to kill germs ”

Romeu & Julieta Estúdio, Gangster, 2012

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The team
Loves

“ We love the idea of a tooth-whitening gangster! He has some wonderfully unique characteristics, achieved through a superb blend of 3D and 2D work ”

Lynette Deputy Editor

Artist info



Estúdio Romeu & Julieta

Estúdio Romeu & Julieta has been specialising in illustration and animation for five years

Personal portfolio site

portfolio.romeuejulieta.net

Country

Brazil

Software used

ZBrush, modo, Photoshop

Work in progress...



Image: Agency: Publicis, Client: Cepacol, Creative Director: Denis Kakazu Kushiya, Developer: Selma Momosse | Art Buyer, Illustration: Romeu&Julieta Estúdio

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The latest news, tools and resources for the 3D artist

Olympic designs

Cutting-edge technology combines with innovative design in competition-winning installations created for London's 2012 Olympic Games

London has been brightened up with sculptures over the past months, from giant replicas of javelins to immersive and interactive pieces, all in celebration of the Olympics. Each is a competition-winning project and belongs to 'Wonder: Incredible Installations', a series commissioned to showcase the capital's design talent. Many pieces were designed by teams at the Bartlett School of Architecture, including a gazebo with a living fungus inside, a giant tea-making machine and a huge, pink puzzle.

The competition brief was open, allowing for a wide range of influences. "Looking at video games like *Minecraft* [and] *World of Goo* [the] capacity to generate an open-ended game was always the main focus," say Alisa Andrasek and Jose Sanchez, part of the team behind sculpture *Bloom*. This wasn't the only project with a playful twist, as Iain Borden explains about the *Universal Tea Machine (UTM)*: "We explored possible ways to engage the public with a piece of kinetic architecture

that might convey a British sense of absurdity, and decided that a giant tea-making machine was the most logical proposition!"

There is also a serious side to the designs: "[The UTM] invokes central components of London's vibrant cultural, trading and financial life," explains Borden. The beautiful *Algo(e)zebo* carries a poignant ecological message. "The vertical columns [supporting the gazebo] incorporate algae tubes," says one of its architects, Marjan Colletti. The vapours

to rewrite our algorithms in Python. We also used Grasshopper as a UI builder," say Andrasek and Sanchez of *Bloom*. Borden incorporated Adobe products too: "Hand sketches [were] worked up into a main design model in Rhino, from which we took 2D outputs into Illustrator and Photoshop." Some projects even used completely new programs, with *Algo(e)zebo* using "Nupas-Cadmatic, a bespoke software developed by the fabricator," in an example of a unique process creating great results.

"It's really difficult to forecast people's behaviour," say Andrasek and Sanchez, but it's the solid message, cutting-edge technology and fun, user-driven experience that

makes the projects special. As the eyes of the world turned to London this year, Borden hoped the pieces would inspire visitors and residents alike, to spur "their curiosity to go on thinking of this wonderful city as a place of innovation, creation, discovery and surprise."

For more information on all of the installations, visit www.molpresents.com.

"We explored possible ways to engage the public with a piece of kinetic architecture that might convey a British sense of absurdity"

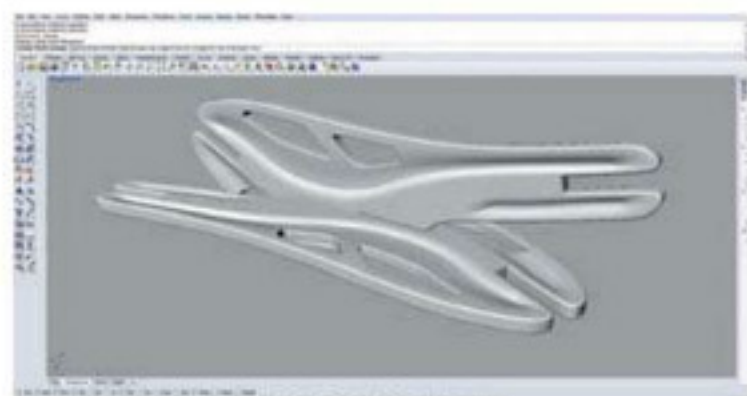
Iain Borden, professor of Architecture and Urban Culture

released by the algae gather as a visualisation of air pollution; an unusual juxtaposition of industrial design and living, organic biology.

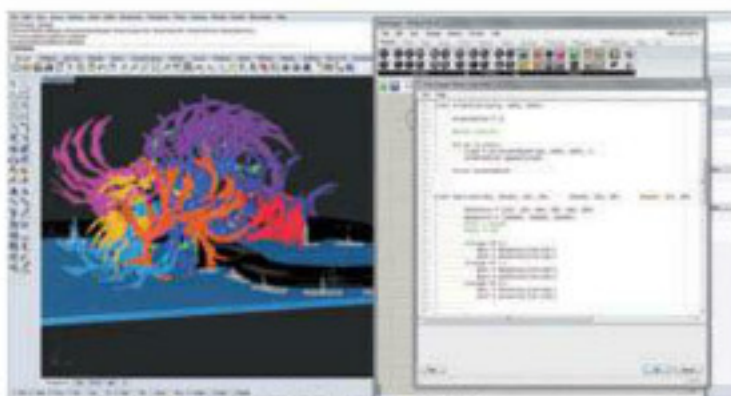
The workflow for each project was different, from the sketching and algorithm-generation stages to visualisation and fabrication. Rhino and Grasshopper featured heavily: "We used a Beta version of Rhino 5

The making of Bloom

The design and fabrication process that brought the team's vision of an interactive game to the public



"We did a simple mockup using Processing and an L-System... that would generate branching structures recursively repeating a piece of geometry," explains Andrasek and Sanchez



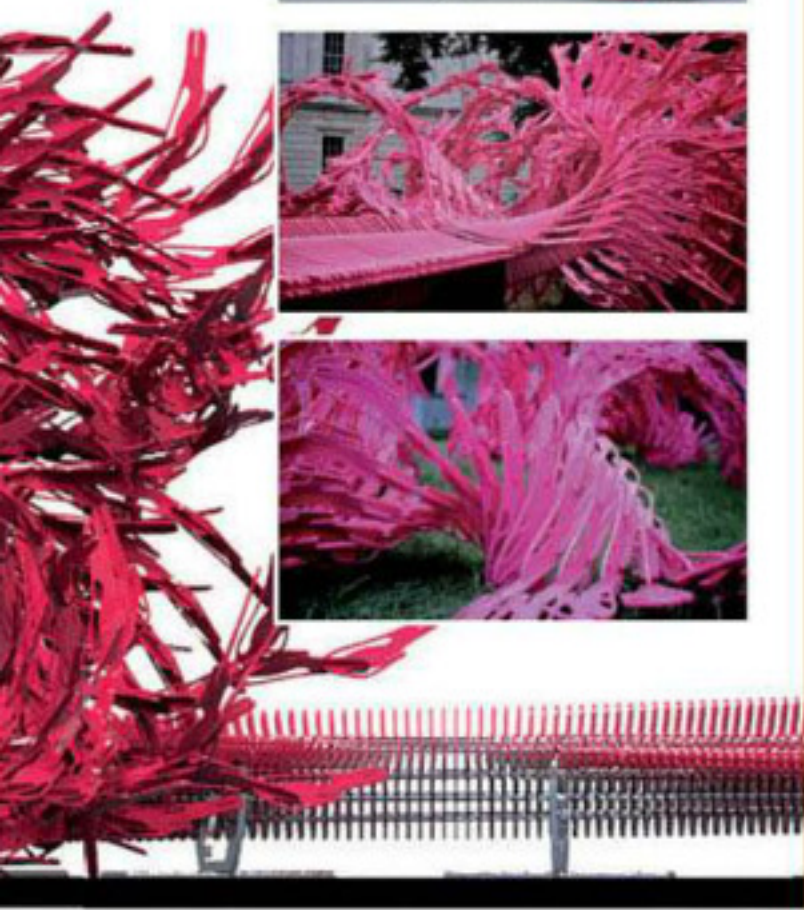
During the design process, the team tested the cells, simulating the "combination and recursive aggregation of any geometry... to explore the possible formations," they continue



The pieces that are slotted together to form an infinite variety of shapes and patterns are created by "injection moulding of plastic, using a unique CNC metal mould," the team adds

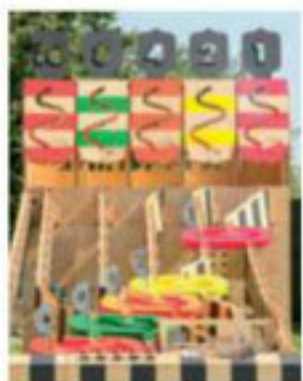
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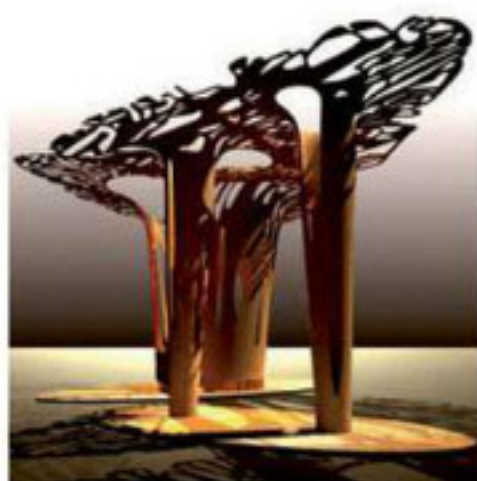
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What makes a winning design?

From something as quintessentially British as the cup of tea to a gazebo with environmental themes, each of the installations won the opportunity to be showcased in the 'Wonder' series due to their strong visions. The teams behind *Alga(e)zebo* and the *Universal Tea Machine* give an insight into what inspired them to enter and what drove the different designs.



Iain Boden explains: "We wanted a design that had multiple values; something that appealed to people... and that was at once silly and serious"



© Marcos and Marjan

"The gazebo triggers associations of dynamism, indeterminacy, transparency, as well as joyfulness, festiveness and community," says Marjan Colletti

3D Sketchbook ZBrush tips



Discover the benefits of ZBrush when it comes to creating monsters...

Gordon Goane www.gordongoane.tk

3D character artist Gordon Goane, a graduate of The Art Institute of Fort Lauderdale, Florida, made this piece while practising with ZBrush. "ZBrush has been my weapon of choice for years now," he tells us. "It delivers on so many fronts. Pixologic continues to revolutionise the 3D industry and, for the price, their product is a blessing."

For Goane, the devil is in the detail when it comes to creature design, which he leaves until last in the sculpting process. "The Lazy Mouse feature in ZBrush is fantastic for making steady lines such as wrinkles," he explains. "[I make] things like pores and very fine textures using assorted alphas to get things plotted out, and then I will fine-tune them with various brushes. I've pre-made a bunch of brushes I use for different effects, so that I can quickly choose which will work best. The Inflate and Pinch brushes can be used to get more controlled results when making wrinkles and folds. Also, changing the brush falloff will make a considerable change to most brushstrokes and how sharply they are applied."

"Reference is great to have, whether for inspiration or education," says Goane

Get inspired for digital sculpting

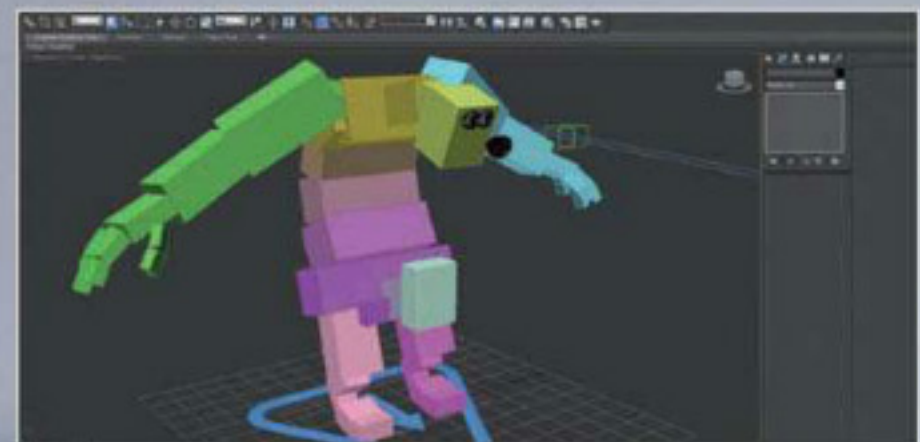
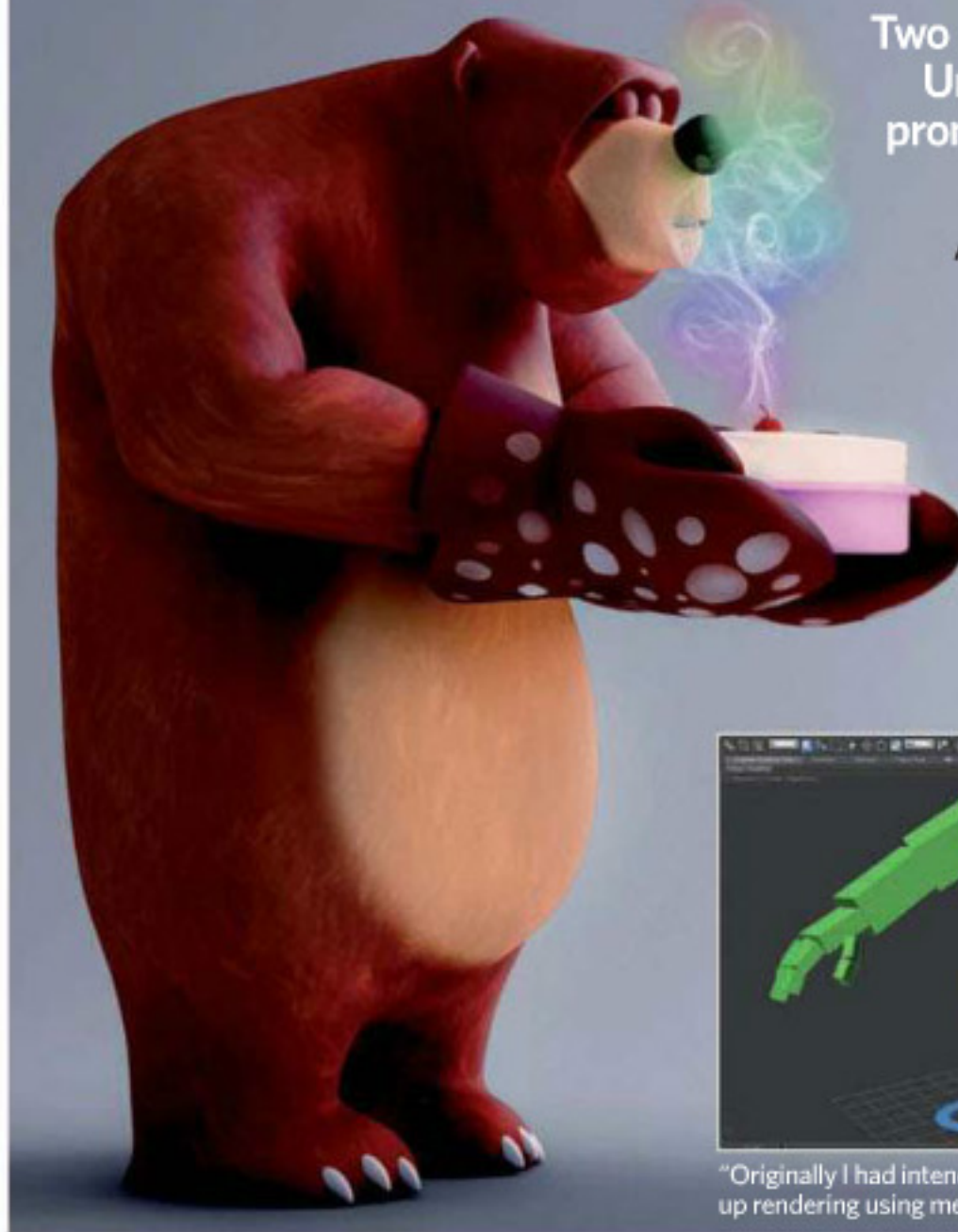
"Research images from photos, comics, movies, games – whatever medium you choose. Working with real clay is also a lot of fun and can be a whole lot cheaper to start with. Practise in any medium you choose, and you'll be making your own characters before you know it!"



D&AD New Blood awards

Two students from Nottingham Trent University have been named 'most promising' by design and advertising organisation D&AD

Abigail Birch and Callum Whitehead have been named Best New Blood 2012 as part of the New Blood exhibition by D&AD. Whitehead, who won for his animation short, 'There's a Bear in my Attic', describes his process: "The animation was created in 3ds Max using the CAT rig to create the base mesh and rig the bear. Mudbox [was used] to hand paint the bear and Photoshop to tweak the UVW maps and add more depth to the textures." Congratulations to them both!



"Originally I had intended to render the animation using V-Ray, but... I ended up rendering using mental ray," says Whitehead



Future technology

Take a glimpse at the peripherals that could rock the 3D world and make creating art more intuitive

With the announcement of the Cintiq 24HD touch, Wacom proved that it's not bucking the trend of more intuitive, gesture-based hardware. For 3D artists the advantages are potentially enormous, signalling greater control, a more fluid experience and ultimately a smoother workflow. We look at some peripherals that could be shaping the way you work in the near future.



A Brekel Kinect Pro Face

A facial mocap application, Brekel Kinect Pro Face uses Microsoft's Kinect device to track movements without markers. "Getting basic timing quickly by capturing it can save a lot of time and put the focus on animating the details instead of spending time doing the boring basics first," says its developer Jasper Brekelmans. The software is available now for \$99 US at www.brekel.com.



B Adapted Wii Remote

Micah Denn has adapted a Nintendo Wii Remote to work as a tool for Blender. He does recognise the limits however: "The Wiimote can be a good tool for rough modelling but making precise edits and movements can be a problem."

C Leap Motion

Inspired by 3D modelling and available in early 2013, Leap Motion is a sensor that tracks hand and finger movements. Pre-order the device at <http://leapmotion.com>.

Masterpiece 'The Last Stand'



Spanish artist Francesc Camós discusses the creative process behind a piece inspired by his country's turbulent history

Francesc Camós www.francamos.blogspot.co.uk

"The Last Stand is a composition based on a picture of two old women carrying rifles in the Spanish Civil War", says Camós of this affecting piece of work. "My main aim with the image was to try to tell a story that was open to interpretation. If it's done well, the image should arouse feelings of sadness and despair for a human being out of place, with no hope for the future."

Camós has been a 3D artist for six years, but he also has a PhD in Philosophy and has dedicated 15 years to researching the philosophy of language.



SEE YOUR WORK HERE!
3DArtist Community
Contact Chris with your news at chris.mcmahon@imagine-publishing.co.uk

Camós lit and modelled the scene in Softimage to play with shapes and shadows for composition, then modelled the old woman separately in ZBrush.

The real challenge came with MARI. "I had never used that software before and although I had to learn the fundamentals through to the more advanced techniques in a short period of time, I eventually found it to be very intuitive."

Camós feels the best images transcend software. "I believe that a picture that makes you think and lets your imagination fly is a picture worth looking at for many years; one that will not get anchored by whatever the best software or technique of the time it was created in."

Inspiration corner Dreaming in 3D



A dedicated team from the ArtFX school in France have created a touching and visually stunning short based on a character who lives upside down

Clement Lauricella, Arthur Seguin and Kimberly Honma <http://vimeo.com/44644179>

Inspired by a dream he had where gravity was reversed, Clement Lauricella and his team brought the concept to life in the gorgeous short 'Reverso'. Through "combining CG and 2D styles", Lauricella's aim was that each still would be able to hold its own as a digital illustration.

A large part of the process was dedicated to pre-production, as he explains: "The organisation was very important [for every] stage of the production (modelling, layout, animation, rendering and compositing) to give homogeneity to

the whole film." Spending two months on storyboarding alone, it was a meticulous process: "All the sets, characters and props [were modelled] in Maya... Then came the test phase for the general look of the movie and the texturing with Photoshop and Mudbox. We started the animation... [then] over the last months we had to render more than a hundred shots and do the compositing and colour grading in NUKE," says Lauricella.

You can watch 'Reverso' now on its Vimeo page: <http://vimeo.com/44644179>.



"The animation of Barney... was a challenge because we needed to understand all of his movements as well as his way of life so they could be realistic," says Lauricella





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Free 3D Resources

Free Trek meshes

Free downloadable meshes ideal for hardcore Trekkies and sci-fi artists alike

Downloadable meshes based on Star Trek vehicles

Web: www.trekmeshes.ch



This site may seem like a novelty, but get beyond the fact that it's dedicated entirely to free meshes of vehicles that appeared in *Star Trek* and you will find a useful resource for any 3D artist.

Each mesh is rated with a practical description and is provided in a wide range of formats (although 3ds dominates). The quality varies, but each one can be used as a solid foundation for sci-fi vehicles or inspiration for more detailed sculpts.

It is worth noting that the site is unofficial and not affiliated with Paramount Pictures. You must credit the authors of the mesh in any work posted online and seek permission to use them in commercial work.

**3DArtist**
www.3dartistonline.com Practical inspiration for the 3D community

What's in next issue

Arch
history tower
Chris Kowal
Personal portfolio site:
www.chriskowal.com

Improve your 3D arch-vis modelling skills...
Issue 47: on sale 10 October

To buy your copy, visit
www.imagineshop.co.uk

Artist spotlight

Forming and fragmenting



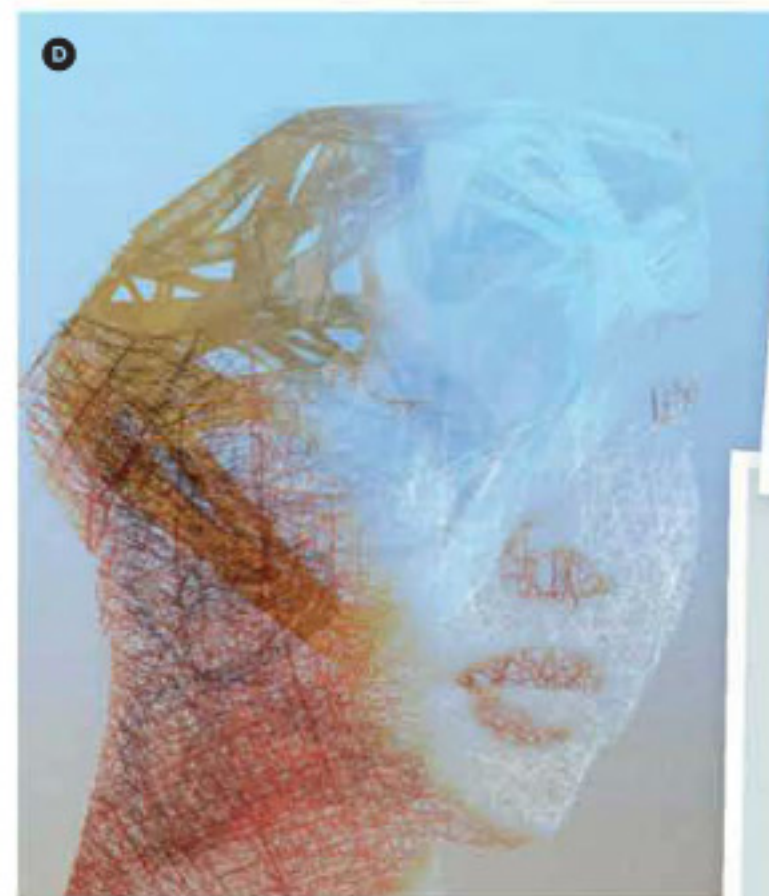
Artist Andre Wee used Rhino and Grasshopper to produce this gorgeous series of portrait-based artwork

Andre Wee <http://cargocollective.com/andre-wee>

Using a program more commonly associated with industrial design, Andre Wee has created a series of delicate portraits in the NURBS modelling engine Rhino. "Being categorised and marketed as 3D-modelling software for the fields of applied arts may make approaching the software seem intimidating or irrelevant for people," Wee explains, but he saw more creative potential.

The pieces were made using one of two very distinct processes, either being formed or fragmented. The first method is to create "three-dimensional

forms in Rhino and Grasshopper and place them on layers in Photoshop. I would then arrange these layers until they started to form something recognisable." The other method begins with a photograph he draws lines on, before re-creating these "in Rhino and Grasshopper, [then exporting] them into Photoshop. These networks of lines and forms are separated into different planes where each plane is then represented by each Photoshop layer. The layers would then adopt different sections of the image and distort it."



D "I am still learning the software... I end up toying with the inputs, sometimes pushing them to their extremes," says Wee

E "I really enjoy how Rhino visualises my commands and inputs in Grasshopper, and how I can see and make logic out of it through play and curiosity," he adds

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B



C



A

3DArtist
Team
choice



D



E

Product of the month

Toshiba 1.5TB Canvio Basics 3.0 Portable Hard Drive

» **Toshiba**
Stockist: <http://us.toshiba.com>
Price: \$170 US
We say: We all know how easy it is to accidentally fill up your hard drive with high-res textures and models when we're not paying attention. Thankfully, we can now ease up some of that strain on our computer memory with Toshiba's 1.5TB Canvio Basics 3.0 Portable Hard Drive. It's capable of holding huge amounts of data, includes an internal shock sensor plus ramp-loading technology to help keep the drive safe. It's also future-proofed with a USB 3.0 interface and USB 2.0 backwards compatibility A.

B Instant Digital Camera - Z2300

» **Polaroid**
Stockist: <http://store.polaroid.com>
Price: \$160 US
We say: Polaroid has reclaimed the charms of its past with the Z2300, a device that combines the instant camera concept of Polaroid's past with the digital technology of today by featuring an integrated printer in the device itself. This enables users to capture, edit - and in less than a minute print full-colour 2 x 3 prints. ZINK Technology also means there's no ink cartridges or ribbons to worry about.

C Frame1 Camera Bag

» **Hard Graft**
Stockist: www.hardgraft.com
Price: £354
We say: There are few camera bags that sound quite as sumptuous as the Hard Graft Frame1 Camera Bag. Made in one of the most respected tanneries in Italy, the stunning material of the SLR camera bag is constructed entirely of vegetable-tanned leather. Using ingredients such as the bark of chestnut trees, the end product is a camera bag that is strong and soft, featuring a warm and natural brown tone that'll be the envy of all friends.

D Ptch

» **Ptch**
Stockist: <http://ptch.com>
Price: Coming soon
We say: In an intriguing new push into the realms of technology, DreamWorks is releasing its first app, titled Ptch. You can remix photos, videos, songs and text into a 60-second music video-style short, or 'Ptch'. Like Instagram you can place different visual styles onto your edits and then upload them to social media sites where friends can re-edit them. Essentially it's attempting to make video editing as intuitive as taking a photo - and all for free!

E eco-amp

» **eco-made**
Stockist: www.eco-made.com
Price: \$8 US
We say: No-one likes waste, which makes this little invention from eco-made the perfect device. Constructed out of FSC Certified 100% Post Consumer Paper, the eco-amp is an ecologically conscious iPhone amplifier. It's easily assembled and fixed to the bottom of your Apple device to enhance the sounds rattling out of the speakers. This means you don't need to carry big, bulky speakers down to the beach - and it will only set you back a mere eight dollars.



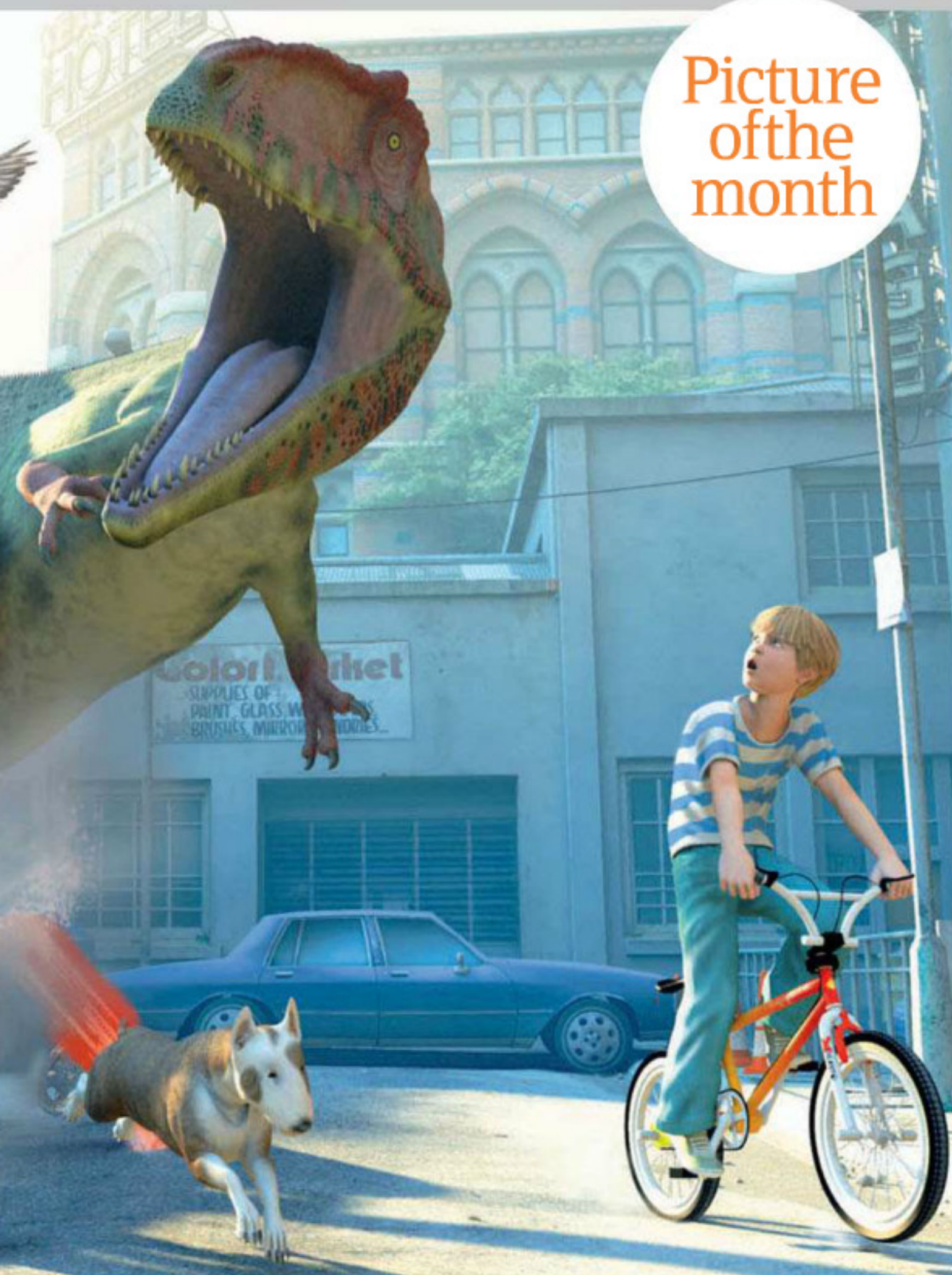
create art in unexpected places





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www.3dartistonline.com
to view the art and chat
to the artists





Picture of the month

Carhartt Jacket Render

» **Midcoast Studio**

Midcoast says: One of four variations of a fully rendered jacket sample

We say: There is something intriguing about clothes that seem to have life when they're not being worn... This jacket is packed with incredible details to give it a genuine and lived-in look

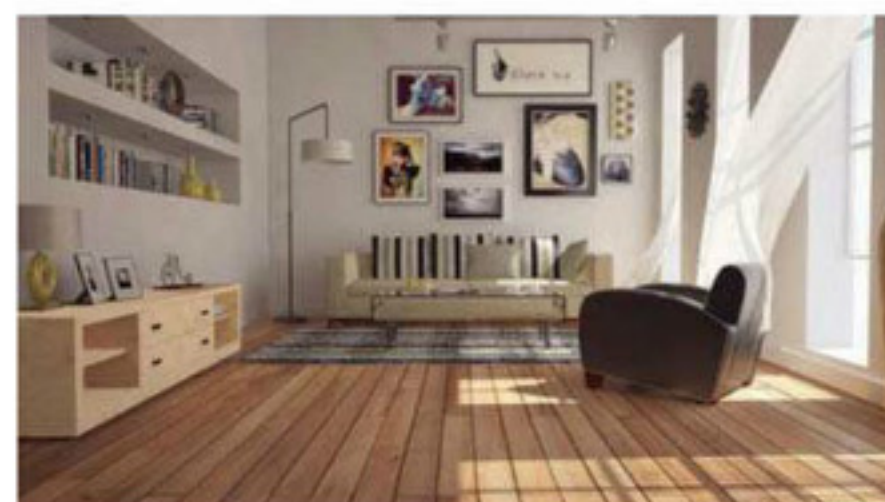


Lizard

» **Thomas Lishman**

Thomas says: Sculpted and rendered using ZBrush and composited in Photoshop, *Lizard* was the result of exploring the realistic application of masks and alphas during modelling while trying compositing techniques

We say: This little guy has some real attitude! We love the expression Thomas has captured here, as well as the awesome skin texture



My first interior

» **Paul McMahon**

Paul says: This is my first attempt at an interior using CINEMA 4D and V-Ray for CINEMA 4D. I wanted to create a breezy, warm summer's day

We say: This is an elegant study that shows care and attention to detail. The billowing curtains add to what would otherwise be a motionless scene



A World Beyond Our World Vol. 3

» **George Krallis**

George says: Created with Vue 10 xStream and colour correction with PS

We say: This is a spectacular vision of a threatening seascape. It's always fantastic to see the photoreal results that Vue can help artists to achieve

Pictures of the week

THESE ARE THE IMAGES THAT WERE AWARDED PICTURE OF THE WEEK IN THE LAST MONTH

Corner

» **Estudio PlotterCad**

Estudio says: [This is a] corner test [featuring a] chair [for an Italian] B&B

We say: Sometimes it's the simple things that make the biggest impact. This small corner has been used wisely to showcase some incredible art, a luxurious seat and a fantastic lamp/easel design

Alien planet illustration

» **Lukas Lancko**

Lukas says: I wanted to try something new with an unusual colour palette [so I] went for a supernatural illustration with dramatic atmosphere, atomic structure shapes [and] alien cities

We say: The cloud formations, dense areas of foliage and the bright lights of huge metropolises give this image a real sense of life

Dinosaurs in my street

» **David West**

David says: I prefer to buy [3D models] and use the manipulability of Poser and the amazing atmospherics of Vue to produce the desired effect before finishing off in Photoshop

We say: The colour and palette really add to the scene. While the scale of the objects might not be quite realistic, they do have a believable charm

Tomatoes

» **Damian Machnik**

Damian says: [Created in] 3ds Max, V-Ray [and] Photoshop

We say: While the subject is simple, the result is a real masterpiece. Damian has clearly studied his subject well to perfect all those tiny details that make for a photorealistic finish

Have your say

Email, Tweet or get in touch with us on Facebook to share your thoughts, opinions and proudest projects

You tell us



Facebook.com/
3DArtistMagazine

Create anything exciting at the weekend? :)

Carlos Fernandez: This is what I created: www.behance.net/gallery/Samurai-Kid/4808423

Dave De Kerf: I made this: <http://dave-dk.deviantart.com/art/Exp-Viper-II-322277829> (Sculpted in 3D-Coat btw...)



Jonathan MacDonald: I did a re-render and a slight change to a previous sculpt I'm starting up again... last post on page 3. www.zbrushcentral.com/showthread.php?161955-Some-Work-I-ve-Done

Stephany Reyes: Learning ZBrush 4R4



Get involved...
@3DArtist

@intelligente Congratulations to my friend AL, who got his first bit of 3D work published in @3DArtist magazine! Awesome! <http://pic.twitter.com/vyt3y8CI>

@RotoDave @intelligente @3DArtist Spends one week modelling. Becomes a published 3D artist. Alan must be over the moon. Maybe I should give 3D a go!

@jonyeahyeah @3DArtist Used a bike from one of your CDs to learn how to match move/comp for the first time: www.youtube.com/watch?v=ocfZ89vK5NE Just thought I'd show :D

digital-tutors

www.digitaltutors.com is a learning resource site boasting a library of 17,000 video-based CG lessons

THE AUTHOR OF THIS ISSUE'S
STAR LETTER WINS A MONTH'S FREE
SUBSCRIPTION TO DIGITAL-TUTORS WORTH \$45

Hats off to CINEMA 4D

I'm a huge fan of CINEMA 4D and it really annoys me when people just say, 'Oh that's just used for motion graphics, right?' - in a snooty way. No, it's not 3ds Max and yes, it is great at motion graphics, but it's so much more than that too. [It's great for] artists and animators who are put off by the intimidating interface of Max or Maya and the steep learning curve. It's so welcoming and

Pauly recently discovered V-Ray for CINEMA 4D and was shocked to find so little information



Star letter



easy to navigate. [But it] is difficult to find tutorials and articles on things other than motion. Modelling and BodyPaint are so tough to find, but when you do it's like striking oil!

Please post more CINEMA 4D tutorials - the workshop on walk cycles for R13 was fantastic and modelling wool was such fun! Please give us more!

Pauly, by email

Thanks for sharing your latest project and giving us a good kick to organise more CINEMA 4D tutorials for you. We hope you'll find some useful tutorial content on the Digital-Tutors website, as your awesome letter has won you one month's free access to the ever-updating Digital-Tutors catalogue!

Metamorphosis

Hi Lynette, I am submitting this image to be considered and reviewed for being featured in your magazine. It is titled *Metamorphosis* and has been created using Maya, ZBrush, mental ray and Photoshop. Since I have always looked to your magazine as a source of inspiration I thought maybe I could contribute something. Hope you like this image and consider it for print. Thank you very much for all the inspiration and support.

Babak Bina, by email

Thanks for sharing your work, Babak! While we can't guarantee every image submitted to us will make it into *3D Artist*, there are ways to ensure you have the best possible chance of being seen:

- Upload your images to the *3DArtist* Online gallery. It's completely free and the editorial team approves images manually - so you can be sure the right people are seeing your work!
- Like our Facebook page and share your work with the team.
- Tweet to @3DArtist on Twitter with a direct link to your work and we'll do our best to check out your latest creations
- Email the editorial team at 3dartist@imagine-publishing.co.uk with your image attached and a brief description of your work



Each week the 3D Artist editorial team picks an 'image of the week' from your latest gallery submissions



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Image Courtesy of Dmitry Gaborak


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BEHIND HALO 4

Chris McMahon talks to 343 Industries' senior art director Kenneth Scott about the new visual approach to Halo 4

343 INDUSTRIES™

A new studio and a new team, bound by a love for Halo

Studio name 343 Industries (343i)

Location USA

Expertise Everything Halo

Key clients Microsoft

Company history 343 Industries – named after the famous Halo character 343 Guilty Spark – was originally founded in 2007 to be the steward of the Halo media franchise, overseeing its novels, comics, movies and all other multimedia content. When series creator Bungie Studios left Halo behind for pastures new, however, it was announced that 343i would become the official developer of a new Halo trilogy, picking up from where Bungie left off

[Above] "The job gets more exciting every step forward we take," says Kenneth Scott

[Right] 343 Industries is currently 250 staff members strong, comprising of ex-Bungie Studios staff plus other talents

343i operates largely on a Maya pipeline, but also uses modo, 3ds Max, ZBrush, Mudbox and Softimage

It was 2007, and *Halo 3*'s tagline made a stark promise: this was to be the closing chapter in Master Chief's six-year-long trilogy. This was to be his final battle. Even series creator Bungie, after completing its work on *Halo 3* spin-off *Halo: ODST* and prequel *Halo: Reach*, had said its goodbyes, leaving the IP with Microsoft and bidding a fond farewell to the Chief.

Things are rarely that simple, though, especially not when a property is as much loved as *Halo*. Master Chief could never stay out of action for long and four years on from finishing the fight he's woken to a new one and a new developer.

343 Industries was initially set up in 2007 as custodian of the *Halo* franchise across various multimedia, whether that was in books, comics, DVDs, or in co-developing titles like the *Halo: Combat Evolved* HD remake. Now, however, it's been thrust into the spotlight as the core developer of a brand-new *Halo* trilogy, tasked with reinventing the series while staying true to its roots.

From completely overhauled audio, a rewritten lighting

system and every single weapon, vehicle and alien remodelled from the ground up, 343 Industries is making broad changes to an experience a fervent and critical fanbase is incredibly protective of.

However, if our conversation with 343i's senior art director Kenneth Scott is anything to go by, this is one developer that knows *Halo* through and through and, from a visual standpoint, knows exactly the direction in which the series needs to go.

“We're actors, costume designers, set designers, puppet makers and puppeteers”

Kenneth Scott, senior art director

BUILDING HALO 4

While at Texas-based id Software, Scott worked on the granddaddy of FPSs, *Wolfenstein 3D*, before moving on to genre-defining

series such as *Doom* and *Quake*. He most recently worked on FPS *Rage*, which introduced technical guru John Carmack's texture-allocation technique MegaTexture to the gaming world. Now he's been given the unenviable task of creating *Halo* anew for an audience that demands both change and consistency.

"Everything starts with narrative," Scott says of *Halo 4*'s new artistic direction. "Understanding the experiential

TIMELINE

2007 Bungie Studios becomes independent, and 343 Industries is created to oversee the future development of the *Halo* franchise

2009 343i's first project is *Halo Waypoint*, a fully downloadable application for players to track their accomplishments and experiences throughout the *Halo* series

2009 The *Halo Encyclopedia* is published

2009 The five-part comic series *Halo: Helljumper* is published

2009 The *Halo: Evolutions – Essential Tales of the Halo Universe* book is published

2010 343i works in collaboration with Japanese anime studios to create the 2D-animated feature collection *Halo Legends*

2010 Another five-part comic series, *Halo: Blood Line*, is published

2010 343i develops the second multiplayer 'Defiant Map Pack' for the Bungie-developed *Halo: Reach*

2011 The *Forerunner Saga* trilogy of books begins

2011 343i partners with Saber Interactive and Certain Affinity to develop *Halo: Combat Evolved Anniversary*, a HD remake of *Halo*



Atmosphere is key to 343i's work on *Halo 4*, so more effort has been put into advanced lighting

THE 343i TEAMS

Senior art director Kenneth Scott talks us through the art teams at 343 Industries



Environment

"Environment art makes up the lion's share of the art team. Every building, wall, door, rock... and vine has been designed to feel a part of the *Halo* world"



Characters

"The character team owns anything and everything that requires animation; vehicles, weapons, monsters and [all] characters"



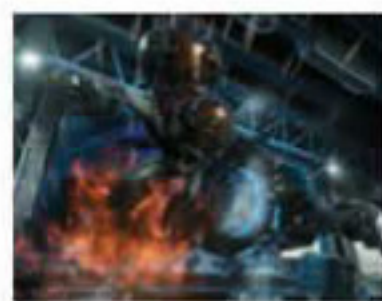
Animation

"Animation owns motion in the game and [the team is] split three ways: in-game animation, cinematics and vignettes"



Lighting

"Lighting, of course, owns lighting. Because they're so interdependent, our lighting team also takes on some additional environment FX work like flare placement"



FX

"FX just blows sh*t up - don't let them tell you any different! In all seriousness, FX's work encompasses a lot: explosions, muzzle flashes, weapon FX and environment details"



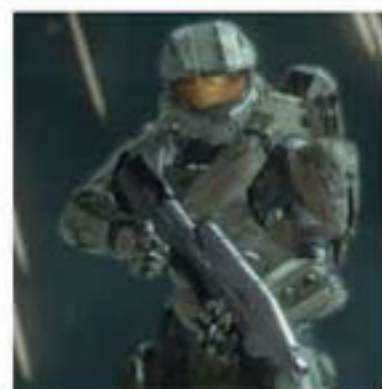
Skybox

"The Skybox team builds the matte paintings and non-interactive environments that backdrop the entire [player] experience"



User interface

"UI manages the front-end and in-game menus, in-game character and weapon HUD work, and a good chunk of our 2D graphic design"



Technical art

"Technical art... supports the more complex shader, material and visual development, and works with the character and animation teams to rig and skin vehicles, weapons and characters. On every front they help to remove as many obstacles as possible"



Playing online usually means sacrificing a certain level of visual fidelity, but 343i has been keen to ensure death matches are still filled with dynamic action

intent and emotional arc of the game before moving into any expensive work is important. We mapped the mood of the game visually, long before we started on concept art," he says. "I dubbed them Broody Boards."

These mood pieces enabled Scott and his art team - which includes impressive talent from Bungie and Pandemic Studios - to grasp the "broad-stroke needs" of the game and get an idea of where to take the experience. "Early atmosphere, lighting, environment and looser shape language are hinted at here," says Scott. "This is usually enough for the art and design teams to then start roughing out geometry [from]."

This geometry will be experienced in the form of Requiem, the huge Forerunner planet on which the bulk of *Halo 4* takes place. Requiem features huge environments that can span kilometres, whether that's inorganic stretches of machinery, wiring and piping, or lush, verdant forests reaching off into the horizon. Getting the geography right for these expansive arenas is key for the level designers, but also Scott's art team, which must ensure players are guided through the world in the correct way.

The team at 343i will often "spin up" visual targets. "These are often pre-rendered scenes that help remove all ambiguity from execution, even to the point of helping define graphics, FX and lighting features,"

says Scott. "This is where the content-quality bar is first set up. It's where teams will hopefully begin to understand exactly where they're heading."

Although these pre-rendered scenes give artists an overview of what is needed from the game, leaving scope for creativity is key. "We need to ensure they stand as good guidance without removing ownership," says Scott. "We want our artists to be empowered, not micromanaged. You've got to trust the people executing this work."

TOOLS OF THE TRADE

With regards to tools, Scott believes that a strong multidisciplinary approach is key to gaining the best results. "The most important tool is always going to be your imagination, but a close second is Photoshop," he says with a smile. "That said, people's success with tools has less to do with a particular advantage a certain program has and more to do with their adaptability. We are primarily a Maya pipeline, but we have Maya, modo, 3ds Max, ZBrush, Mudbox and Softimage users all working in relative harmony. We even have some people braving pencil and paper!"

"Our 3D staff are intensely versatile and can wear many hats," continues Scott. "They are expected to take data from modelling, through UV and texture



“People’s success with tools has less to do with a particular advantage a certain program has and more to do with their adaptability”

Kenneth Scott, senior art director



The base models for *Halo 4* have been sculpted in immaculate detail – notice the veins on the forearm of this Elite



343i utilises a number of techniques to give its environments a real sense of place and depth – check out the shafts of light and dust hanging in the air

work, to in-engine execution at a quality consistent across the game.

“However, a project this big requires more focus over key endeavours. We have departments that exercise ownership over cross-disciplinary areas like Animation, Cinematics, Lighting, FX, Skybox, UI and we have the technical teams that make it all possible.” (See The 343i teams, [page 28](#)).

The results of all these different teams working in harmony are incredibly impressive. At this year’s E3, 343 Industries showed off a level from *Halo 4* that commenced with UNSC Infinity vessel breaking through the atmosphere of Requiem and crashing into the lush jungle below. The scale of the incident is emphasised by Master Chief looking down from the top of a mountain.

Master Chief descends into the foliage after the downed ship, finding himself in a murky rainforest enveloped in a miasmic green fog. The lighting here is particularly impressive, with light shafts breaking through the canopy and strange, silhouetted shadows just visible in the gloom.

“With our team’s strong interest in narrative, our feature work was founded around supporting strong atmosphere and building



MASTER CHIEF’S NEXT CHAPTER

What exactly can we expect from *Halo 4* in terms of story and gameplay?

Halo 4 will be the first entry into what 343 Industries is calling the *Reclaimer Trilogy*; three games that promise a darker and more human story than those they follow. Little is known about the plot, other than the fact that Master Chief – who we last saw entering cryostasis at the end of *Halo 3* – is awoken from his hypersleep to land on the artificial Forerunner planet Requiem, where a new and terrifying enemy awakes. We also know that the Chief’s long-time AI partner Cortana will be experiencing Rampancy – the AI version of insanity that is slowly degrading her ability to reason.

As for gameplay, *Halo*’s famous freeform, 30-seconds-of-fun cycle will remain the core focus of the experience, but this time occurring across much larger environments that are also far visually superior to any before witnessed in a *Halo* game.

Multiplayer has been revealed in much more detail, with new features including eight specialist classes named Pioneer, Engineer, Tracker, Rogue, Stalker, Pathfinder, Wetworks and Operator. Unfortunately, the ever-popular Firefight mode will not be included, but has been replaced by Spartan Ops, an episodic four-player co-op narrative that weaves in and out of the story.

Behind Halo 4

+ HALO EVOLVED

The visual changes 343 Industries is making for its new take on Halo

The UNSC

It seems the human UNSC army will be crash-landing on Requiem alongside Master Chief and will once again bring with them their armoury, including the chunky and sturdy 4x4 offroad vehicle, the Warthog. It hasn't changed a great deal in *Halo 4*, but features a great deal more incidental detail in its modelling, particularly under the bonnet and around the wheels

Forerunner technology

Ancient Forerunner technology has often been encountered throughout the *Halo* games, but usually these are lifeless and inert structures, offering little other than set dressing. In *Halo 4*, Forerunner technology will be seen very much in a state of activity, ranging from huge, glowing alien artefacts to gigantic structures that stretch across the horizon

The Chief

Prometheans

Halo has always been great at coming up with enemy design, with the Covenant alien collective full of creatures big, small and really, really big. The new enemies here come in the form of Prometheans - neon-tinted, exoskeleton-adorned creatures that can pull apart panels on their masks to reveal glowing, fiery skulls. They're meticulously modelled, featuring smooth, curved armour that floats in place rather than being connected by joints

The changes in the Chief's armour were a shock to the system for many a hardcore *Halo* fan when the new design was first revealed, but the changes were made with very good reason. "The very foundation, the tech of the suit, we spent a huge amount of time on," says *Halo 4* producer Kiki Wolfkill. "It was never about filling in the blanks or the chinks in the armour. We wanted to really imagine the functionality of what his tech suit is and how he needs to move in it, and then how the pieces could logically fit onto that"



Audio adds just as much drama to a scene as visuals. Neil Davidge, of Massive Attack fame, is on composing duties for *Halo 4*



[Left] So far, 343 Industries has shown only one level in action from *Halo 4*'s campaign, but it promises we're going to see some truly stunning sights

[Right] As 343i is telling a more human story, facial animation has been a huge point of focus. *Halo 4* promises much more convincing characters



immersive experiences," says Scott. "Lighting work was moved to a more cinematic and flexible model. We also built a powerful suite of post-processing features, like tone mapping, geometric fog, FX lighting such as flares and god rays to help build a strong emotional tone... We also re-envisioned the material and shader systems to hit a high bar of surface quality."

Scott's proudest work is far more simply put: "It doesn't sound glamorous, but the stuff I'm most fond of that the team did awesome work on is adding more polygons and more textures!"

HIGH FIDELITY

Visually, *Halo 4* is shaping up to be the greatest-looking game in the series, which isn't difficult given that *Halo 3* and its spin-offs were often criticised for supporting sub-HD resolutions. Visual fidelity has been a great point of focus here, as confirmed by 343i's franchise director Frank O'Connor. "The rendering engine is a really good example because it's somewhere we've added our own stamp technologically and adds objective fidelity to the game," he says. "I don't have to be humble about saying there are more pixels on the screen, because there *are* more pixels on the screen! The thing we have to be careful about is, do the fans think those pixels are adequately representing the universe?"

Creative director Josh Holmes is wary of the fact that any visual changes are made in deference to the story: "All of the supporting systems - the rendering, the lighting, the audio - these have been completely rewritten from the ground up and dramatically

overhauled," he tells us. "All of that is in service to the experience we want to create and the art's vision, particularly on the visual side that Kenneth Scott wanted to accomplish."

Scott chimes in: "Storytelling in imagery is of big interest to me and we're looking to film and television more intently this time... Not so much around technique and technology - realism is a technical challenge, not a creative one - but more so accepting that we are a camera, and we present things to the eye accordingly."

"We take cues from the film world in how we display things [in *Halo*'s world] to our audience. We make decisions based on where we want the eye to journey and how we want the audience to feel. We compose to the camera. We're lighting things not as reality expects, but in a way that best informs the experience."

There's little more that's been revealed of *Halo 4* - Microsoft and 343i have kept much of the single-player portion of the game under lock and key, for fear of spoiling what promises to be an epic single-player campaign. But

we do know that it is shaping up to be a *huge* project, created by a team that comprises the best of the best.

"We're actors, costume designers, set designers, puppet makers and puppeteers," says Scott of the team at 343i. "We craft experience and immersion; we build worlds, friendships, hates and loves. Art shepherds a good deal of that experiential and emotional enjoyment throughout the game, and being mindful of that is important at 343i." So it seems, thanks to 343 Industries, Master Chief's fight is far from over.

"I don't have to be humble about saying there are more pixels on the screen, because there *are* more pixels on the screen!"

Frank O'Connor, franchise development director



"Narrative should breathe life into even the smallest detail," says Scott

Chief's armour has seen some broad changes, but there are also intricate alterations and refinements



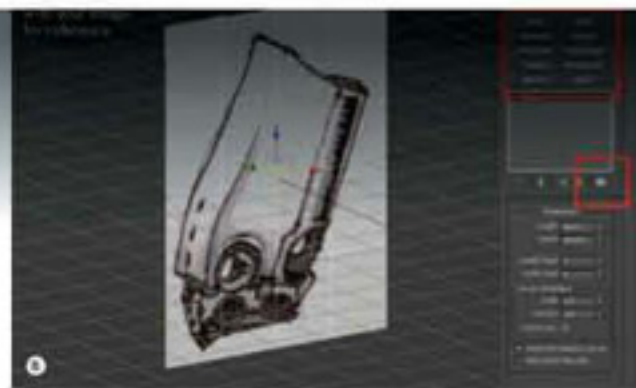


Pre-production



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01 Develop a concept The key to concept development is to draw all your ideas - even the bad ones - as you never know which direction your design may take. Grab the elements that you like from one sketch and then apply them to another in a different way. Just throw down a bunch of ideas without worrying about polishing them or thinking too hard about it. Details can be as loosely represented as random lines; once you have some general volumes you like, then you can take some time to deconstruct it and detail those parts individually.

02 Set up a scene I usually take one of my key concepts and put it in the scene on a plane aligned to one of the axes. I always use an Orthographic camera, but it's especially important at this stage. The Orthographic view makes it a lot easier to make shapes accurate to your concept when you start modeling. I've also added some common modifiers to my Modifier box on the right. I strongly recommend setting up this UI element to support your most-used functions.

Concept

My initial concept was a heavy, low-to-the-ground robot about two/two-and-a-half feet tall. I am really playing with the idea of a 20:80 ratio of detail versus overall shape.



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Arch vis goes green

Hotel development in Glasgow. The footprint of the building is very similar to that of the previous development, making it a more efficient turnaround. Image modelled in 3ds Max and rendered in V-Ray. Post-production completed in Photoshop and After Effects



ARCH VIS GOES GREEN

Powerful information-driven tools have advanced the cause of sustainability in architecture, but how can this translate to visualisation? Words **Michael Burns**

In these recessionary times, you would think that the worthy quest for greener, more environmentally beneficial buildings and architecture would become secondary to the business of just staying in business. It's a widely held view that sustainable design costs more or is less profitable. However, according to Sandy Halliday, author of *Green Guide to the Architect's Job Book* (RIBA Publishing 2007), the best available data indicates that there's no discernable statistical relationship between capital costs of similar types of buildings and their environmental impact. Many beneficial and sustainable features add little or no additional capital cost. Crucially, these have also been proved to deliver cost benefits when in use.

"Sustainable doesn't have to mean more expensive," says Jorge Gracia (www.graciastudio.com). "The key is how to make designs appealing, utilising the least resources possible. Clients expect more and more durability and sustainability."

Sustainability is a key issue for Garcia. "Most of our projects are in Mexico," he says. "We always find sustainability in our projects, not because of a trend but because it's a need. We search for local labour, local materials, try to use passive ventilation and we respect nature; it's easier than hiring a landscape architect to do what was already there."

To meet CO2 emissions targets and other sustainability targets, there are a host of guidelines in place for designing domestic and public buildings such as AECB CarbonLite and BREEAM in the UK while USGBC: LEED is a standard in 40 countries worldwide including Mexico, India and the USA.

Rising fuel prices are also a factor, prompting moves towards zero-energy buildings such as those defined in the Passivhaus methodology.

THE ARTIST'S APPROACH

How does this affect architectural visualisation companies? "Sustainability in architectural design is not just an environmental concern," says David

Houston, 3D artist at Soluis. "It also affects the aesthetic and social implications of a design. This in turn allows for more interesting materials and forms that generally make for fantastic images and animations."

Houston sees architectural visualisation as one component in a larger design process. "We provide a service to architects, contractors and developers who have

equal responsibilities to stay sustainable," he says. "The ability to use visualisation early in the design process not only makes for a more effective design workflow, it allows common errors to be eradicated early on. A plan drawing will never allow you to predict how occupants will interact with a building, which is crucial to successful design. So in theory the earlier we as artists can get involved in the design process and begin to conceptualise the look and feel of a building, the quicker designers can narrow their ideas into a resolved solution."

"Design decisions caused by sustainability in architecture can often be seen at the visualisation phase," agrees Ross Board, design and planning specialist at Sustainable Power Generation Ltd (SPGL). "However, by this point architects tend to have already made the core moves, incorporating

details to accommodate things like green roofs and building integrated photovoltaics. The way in which visualisations are presented has changed as a result of sustainable efforts though and there is undoubtedly a change in everything from people in scenes to the overall atmosphere portrayed. This trend will ultimately continue as the green movement strengthens."

"Sustainable architecture used to be characterised by hand-drawn sketches of hairy buildings with sun-path diagrams," says Christian Dimbleby, architect at Architype. "But as the construction industry has become more committed

“The earlier we as artists can get involved in the design process... the quicker designers can narrow their ideas into a resolved solution”

David Houston, 3D artist

CONTRIBUTORS



David Houston

Role 3D artist
Studio Soluis, www.soluis.com
Expertise Architectural product visualisation and animation. Works on all stages of a project from image conception and modelling, to lighting and post-production
Software/tools used 3ds Max, V-Ray, Photoshop, After Effects



Christian Dimbleby

Role Architect
Studio Architype, www.architype.co.uk
Expertise Low-energy design, embodied energy calculation, BIM and Post Occupancy Evaluation
Software/tools used Autodesk Revit, Autodesk Ecotect, Vectorworks PHPP



Nigel Hunt

Role Creative director
Studio Glowfrog, www.glowfrog.com
Expertise Compositing and retouching
Software/tools used Photoshop, After Effects, 3ds Max, V-Ray



Ross Board

Role Design and planning specialist
Company Sustainable Power Generation Ltd (SPGL), www.spgl.net
Expertise Renewable energies, architecture, architectural visualisation and VFX
Software/tools used AutoCAD Civil 3D, 3ds Max, V-Ray, Ecotect Analysis, Revit, Helios 3D

Arch vis goes green



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[Main image] Residential development in Edinburgh for CALA, a returning client for Soluis. The studio tries to be more sustainable and flexible by creating model archives of repetitive CALA features

[Left] Views of the NRP Enterprise Centre, which will be a hub for joined-up, low-carbon thinking. It will enhance UEA's reputation for sustainability and will act as stimulation for the regional economy through its contemporary use of local natural materials and products

to sustainable construction, the visualisations and ways of expressing the environmental benefits have become crisper, clearer and more informative. These can now demonstrate the physical properties of spaces to be inhabited, such as the natural daylight, and textural and material qualities of a room. Graphics showing energy use and other targets are often created in a visually appealing manner rather than endless data fields."

Dimbleby insists care still needs to be taken that these glamorous and seductive images are actually tackling environmental issues and not just greenwash – bolting on renewable technologies to appear sustainable, but not addressing other design issues.

BIM TOOLS AND THEIR IMPORTANCE

Companies working in the arch-vis sector are becoming familiar with Building Information Modelling (BIM) technology, through which a wealth of parametric data regarding building materials, energy and resource requirements is collated. Even the relationship of a building with the surrounding environment can be fully charted, controlled and collected for use in construction, performance analysis and maintenance. Commercial BIM software, such as Autodesk Revit,

Graphisoft ArchiCAD, Vectorworks Architect and Bentley Architecture, is able to specify and store accurate digital information for all components of the building. This includes everything from roof material down to the carpets, including cost, their likely lifespan, their thermal properties and how green they are. Many tools also offer direct

“Care still needs to be taken that these glamorous and seductive images are actually tackling environmental issues and not just greenwash”

modelling capabilities inside the BIM environment, while some like Autodesk Revit and Revit Architecture offer raytracing. This enables interactive real-time rendering and Rich Photorealistic Content (RPC) to be rendered in the viewport. With a particular focus on sustainability, the Green Building XML Schema (known as gbXML) has been created as a common standard, offering interoperability between many CAD and engineering tools such as Revit, Ecotect, Bentley Architecture and GreenspaceLive gModeller. The latter is a SketchUp plug-in, which turns existing SketchUp models and supported formats into gbXML for use in energy analysis software.

"Architects are using software to generate and

determine their designs in much the same way as the manufacturing industry uses it to rationalise and perfect product design in industries such as cars, yachts and aircraft," explains Nigel Hunt, creative director at Glowfrog. "With BIM every building can be tested and refined prior to going on-site, making the design more efficient, cost-effective and

sustainable. As a subcontractor to the design industry we respond by representing these designs in a sympathetic manner, drawing attention to the designs qualities such as green roofs and sustainable materials."

On the visualisation side, Ross Board has experienced an increasing number of architects supplying models outputted from BIM tools such as Revit. "It is important for visualisation companies to keep up with this trend," he says. "It certainly makes sense to at least have light analysis tools such as Autodesk's Ecotect to hand, for example. Autodesk's free Project Falcon can also be helpful for aerodynamic analysis."

"Autodesk is ultimately the key supplier of software solutions to the industry," says David Houston. "It's making crossing platforms between design and visualising easier and more intuitive, in short more sustainable. The architects that are beginning to encompass a BIM-based workflow using Revit make our job considerably easier.



Wembley Northwest
Lands by Glowfrog for
Quintain Estates &
Development PLC.
Created in 3ds Max,
Maya, V-Ray, Photoshop.

Supplying very detailed plans and models effectively reduces the large time-consuming tasks that can take visualisers weeks to complete. By reusing the BIM data supplied, visualisers don't just have an accurate model; if the design alters for any reason – which it almost always does – the updated BIM data can replace and supersede the model within a very short timescale. This not only reduces project timescales and costs, but also significantly reduces data storage by removing multiple redundant design models."

Don't go thinking that this is a build-by-numbers solution, however. "Many clients are working with BIM and submitting their models to us for use," says Nigel Hunt. "The majority of times these only act as a starting point for high-resolution work – similar to

SketchUp. Depending on the client and their knowledge of BIM, we need to optimise the model, stripping out vast amounts of unused geometry and reconstructing the model using instancing and proxies. It has helped inform us of the design, but in general our pipeline hasn't really changed with clients using BIM. There's still a lot that needs to be manually reworked including materials and high-detail geometry."

TYPICAL SUSTAINABLE DESIGN PROJECTS

How this works practically is that the architect will initially develop the project in BIM software, then provide the visualisation studio with the data. For example, a typical Soluis project involves the studio being supplied with a base model created by the architect in Revit. This is then set up in 3ds Max and rendered in V-Ray, with post-production completed in Photoshop.

"The largest project [for Glowfrog] in the past five years has been our work at Stratford, working on *Athletes Village*, *Westfield* and *The International Quarter*," says Nigel Hunt, describing this Olympic project, and a concurrent project on the Greenwich Peninsula, as huge regeneration projects that have a major impact.

"We worked closely with 16 leading architectural practices," explains Hunt. "We helped visualise the designs from early concept through to CGI marketing [presentations]." Here again Glowfrog was provided with data from Revit as well as SketchUp and Rhino, carrying out the work in 3ds Max and V-Ray.

Energy simulation and modelling can significantly influence the design and look of a building, if carried out at an early stage, and integrated into the process of the whole team. For example, Architype's expansion of Holy Trinity Primary School in Richmond, used modelling in Autodesk Ecotect to assess the daylighting and work out the optimum shading to provide good daylight without overheating. "The random shading shapes were developed into an architectural feature, forming a birds' nest roof to the

TOOLS FOR ENERGY ANALYSIS

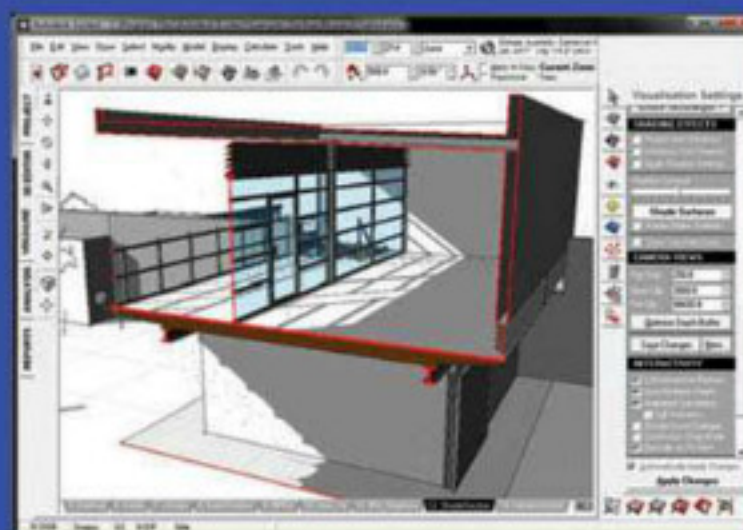
Evolving from the BIM technology revolution, architects now have access to software that can perform whole building energy analysis to better understand energy use and the carbon footprint implications of building designs. Many support the gbXML interoperability standard for transferring data between applications.

Autodesk Ecotect Analysis offers a wide range of simulation and building-energy-analysis functionality that can improve the performance of existing buildings and new building designs. Tools enable you to visualise and simulate a building's performance within the context of its environment. Autodesk Green Building Studio integrates with Ecotect to provide a web-based building-energy and carbon-analysis service. All of the subscribers' computationally-intensive hourly simulations are carried out on remote servers and the results are provided in a web browser.

Graphisoft EcoDesigner uses a three-step workflow (model, evaluate and report) to determine the energy characteristics of the project directly within the ArchiCAD design environment. It can therefore turn the ArchiCAD Virtual Building into a building energy model with minimal effort and updates the building energy model automatically during architectural design.

Architects are also able to look forward to RAPIER, a web-based collaborative optioning tool for green buildings, currently in the prototype stage. Developed by Architype, BDSP Partnership, GreenspaceLive and Sweett Group as part of a two-year R&D project part-funded by the UK Technology Strategy Board,

RAPIER is an early-stage design tool for understanding the full Life Cycle Assessment, and uniquely combines both the carbon and financial analysis of a design. Christian Dimpleby, architect at Architype explains: "Quickly and easily you can produce or modify a range of building options each with a visual display of the size and shape of the building, the headline figures for capital cost, lifecycle cost, embodied carbon and operational energy," he says. "Therefore comparisons between different options can be rapidly made and visualised in graphics cards. It can then output into universal language gbXML for inputting into most CAD packages. Future outputs from RAPIER could be colour coded with carbon effects, or other means of more graphically representing the buildings' environmental performance."



Autodesk's Ecotect Analysis software offers simulations and building energy analysis to aid sustainable building design

Arch vis goes green



A potential view of Stratford Olympic Park and London from commercial buildings at The International Quarter. Created by Glowfrog in 3ds Max, Maya, V-Ray, Photoshop



All of the vis work of Soluis is created with an eye on sustainability, from the use of BIM-based workflows to cloud rendering



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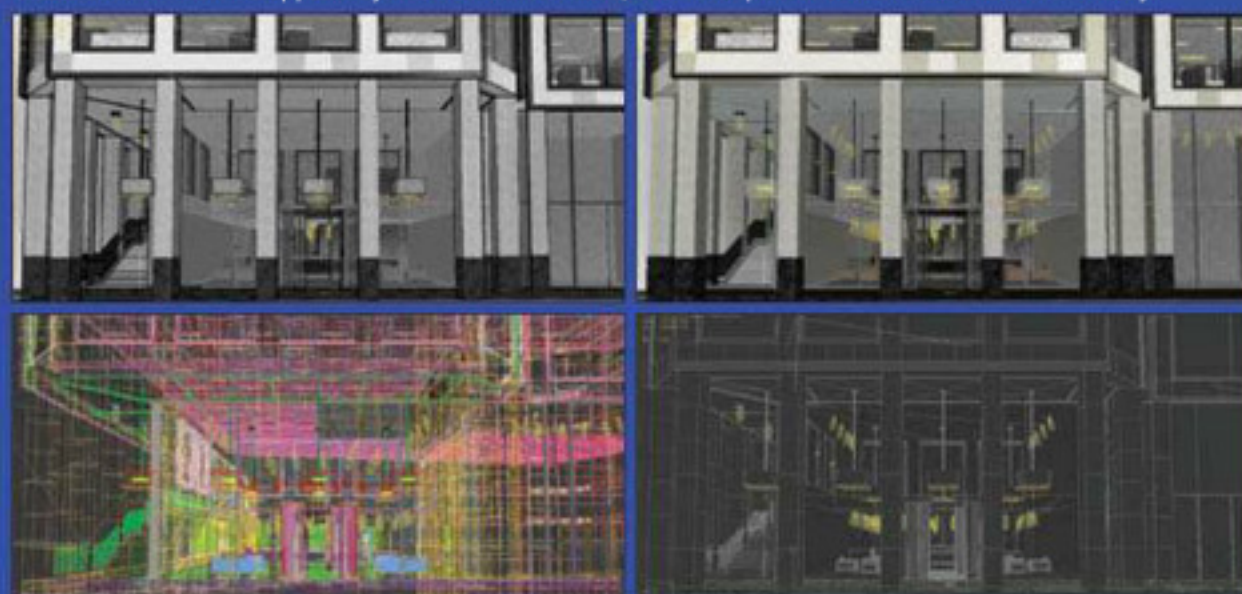
Rainbow Free School by Soluis, for Keir Group. Modelled in 3ds Max and rendered using V-Ray



INTEGRATING BIM TOOLS INTO THE ARCH-VIS WORKFLOW



The base model was supplied by the architect in Revit, then set up in 3ds Max and rendered in V-Ray



Project Monument Place
Client Wordsearch/David Walker Architects
Studio Soluis, www.soluis.com

The general workflow that Glasgow-based Soluis uses for Revit-supplied data is relatively straightforward. It can be examined in more detail by studying the visualisation work the studio carried out for Wordsearch/David Walker Architects and the Monument Place project. "Located in the core of London, this new development provides 75,000 square-feet of office space," says David Houston. "The base model was supplied by the architect in Revit, making it a very efficient design process. This was then set up in 3ds Max."

Revit works in imperial measurements, which Houston says makes it considerably tricky to convert lighting and material UV map units within 3ds Max.

"For best results, export the Revit file as an FBX [or specify that the client does so]," he says. "This will then import into 3ds Max and include all your materials in Autodesk format. The materials will require to be converted to whatever rendering engine you are using; in this case it was V-Ray. If you maintain a well-organised file, it's fairly straightforward to rematerialise and add new iterations if the design alters for any reason. Be aware of slow performance for large projects that contain lots of data. To improve performance, limit the model geometry being exported, or ensure that the client supplying the information is aware of the capabilities of 3ds Max."

According to Houston, rendering times are not affected by the geometry provided from Revit. "That side of a project is down to each individual's workflow within 3ds Max," he explains. "With this specific project we had a mix of photomontages and fully-rendered images, depending on the viewpoint and the context that was required."

The Monument Place project was rendered in V-Ray with post-production completed in Photoshop.



Limassol Marina, Cyprus. The project is having a positive effect on the city and the regeneration of the centre. Created by Glowfrog with 3ds Max, V-Ray and Photoshop

building," explains architect Christian Dimbleby. "On Architype's Passivhaus schools in Wolverhampton, the Passivhaus House Planning Package (PHPP) was used to influence the orientation, window sizes and locations of the building so that they would meet the strict energy and comfort criteria, and fit into their urban context."

"On a daily basis with SPGL, we utilise Autodesk's 3D CAD and visualisation tools to accomplish all manner of tasks," says Ross Board. "From laying out solar parks based on geographic sun angles and shading simulations, to accurately assessing visual impacts of wind turbines on the landscape. BIM and advanced computer design tools have revolutionised the industry and will no doubt continue to do so [in the future]."

These sustainable decisions aren't just made in design software though – arch vis takes up a lot of rendering time and computing power. Here, using external

render farms or cloud-based services can help, but it's also worth looking at the design workflow itself. For example, Soluis takes a sensible approach when dealing with CALA, a returning client: "We try to stay sustainable by creating model archives of repetitive CALA features," says David Houston. "This allows our modelling process to be much faster."

THE FUTURE IS GREEN

According to Nigel Hunt, every architectural client is now designing with sustainability in mind. Sustainability-focused data from BIM tools and especially green building energy-simulation tools can have serious implications for visualisation projects. "As visualisation artists, we rely heavily on accurate data supplied by either the client or the architect," says David Houston. "When we structure a project, we break it into two components: the modelling

process – the physical modelling before any lighting or rendering is carried out – and the creative process, where all lighting materials and artistic control is implemented. The two portions of a project are given estimated timescales; if the information we are supplied is not accurate, the modelling proportion can take considerably longer, eating into the creative side. This... can hinder the opportunity of creating great images and animations."

Houston feels that through integrated project delivery, an approach to projects that brings together people, systems, structures and practices, companies like Soluis can begin to co-ordinate more efficient design workflows. But he is firm that sustainable design decisions should happen during the iterations of the BIM-development process. "With the exception of materiality, the sustainable ethos of a building and the use of such applications as green energy-

simulation tools are seldom conveyed in an artist's impression," he says. "More often than not we only use the BIM development process to provide a more accurate and faithful depiction in a much shorter time."

Ross Board feels sustainability-oriented data could be useful in all manner of ways. "Obvious situations where this may be the case include things like solar and wind simulations," he suggests. "Dictating where exactly that flag should be waving or where light should glance a building; things such as heat and thermodynamic simulation may one day also become relevant."

"Presently, the benefits aren't great for arch vis, but little touches that an artist can add to an image or video can show they have understood the vision of the architect in terms of sustainability. Things like geographically correct lighting and the correct demographic of vis people in a scene can add to a final output."

“Little touches that an artist can add to an image or video can show they have understood the vision of the architect”

Ross Board, design and planning specialist

Arch vis goes green

FURTHER INFORMATION ON SUSTAINABLE DESIGN

Sustainability is a hot topic, so there's plenty of material online and in print to get you up to speed and involved in this sector



ONLINE RESOURCES

- The National BIM (Building Information Modelling) Library www.nationalbimlibrary.com
Developed and managed by NBS for the UK construction industry, this is a free-of-charge online resource enabling construction professionals to locate and download generic and proprietary BIM objects
- NBS Sustainability blog www.thenbs.com/blogs/sustainability
Sustainability information from NBS and RIBA Enterprises
- Sustainable Development Commission www.sd-commission.org.uk
The Sustainable Development Commission is the UK Government's independent advisory body on sustainable development
- SUST. www.sust.org/index.php
Developed by The Lighthouse in collaboration with the Architecture Policy Unit at the Scottish Government, SUST. gives free access to a wide variety of information, resources and guidance on sustainability
- Code for Sustainable Homes www.planningportal.gov.uk/buildingregulations/greenerbuildings/sustainablehomes
National standard for the sustainable design and the construction of new homes, which aims to reduce carbon emissions and create homes that are a lot more sustainable
- Autodesk Sustainable Design <http://usa.autodesk.com/sustainable-design>
Central portal for Autodesk solutions for sustainable buildings and infrastructure, green manufacturing and product design, and clean tech

REVIT WHITE PAPERS

- <http://usa.autodesk.com/revit/white-papers>
Technical white papers for information about learning and using Revit

GRAPHISOFT WEBINARS

- Green BIM online seminar and others from the developer of ArchiCAD and EcoDesigner
www.graphisoft.com/education/webinars
www.bimcomponents.com
Graphisoft offers a cloud component of ArchiCAD 16 that is built directly into the user interface. Users inside of ArchiCAD 16 can perform searches for BIM components, download items and upload their own custom components

PUBLICATIONS

- **Rough Guide to Sustainability: Third Edition** by Brian Edwards, RIBA Publishing. A student and practice primer, which equips the contemporary architect for designing buildings for sustainability
- **BIM in Small-Scale Sustainable Design**, by François Lévy, Wiley Publications
This book discusses in detail how building information modelling can effectively be used by small and medium-sized architecture firms to design more sustainable buildings
- **The Environmental Design Pocketbook**, by Sofie Pelsmakers, RIBA Publishing. Places the information you need for sustainable, low-energy building design at your fingertips. Twelve sections guide the designer from the fundamentals through to the building details themselves
- **Eco-Minimalism: The Antidote to Eco-Bling**, by Howard Liddell, RIBA Publishing. This book highlights more realistic and cost-effective approaches to going green by showcasing eco-minimalism – a good-housekeeping approach to ecological building design and specification

I made this...

Incredible 3D artists take us behind their artwork

Artist info



Igor Rashkuev

Website www.oxeren.deviantart.com

Country Russia

Software used 3ds Max, V-Ray, Photoshop

Bio Igor got to know 3ds Max at the age of 12 and since then has been heavily involved in the world of CG.

“The Spacing tool is quite useful and can be used to create such things as different hoses, tracks and other stuff that consists of multiple identical objects”

Software used in this piece

3ds Max

V-Ray

Photoshop

Steam-powered Factory 2012

I started this work as a steam tank concept, but then I decided to create the environment for it, so it eventually became what you see now. I was working on this piece for quite a long time because of the fact I was taking big breaks while making it. It was a nice chance to use the skills I'd acquired on my previous job and create some decent work for my portfolio.

“Post-production is always important. It's usually wise to render different objects separately to make the process easier. In this work I rendered the background, then the tank... and then the pipes on the foreground. I then made some colour correction, enhanced lighting with a Color Dodge layer and added volumetric light”



“ Don't forget to give names to objects and groups. Large scenes are very difficult to manage without proper naming. Also, layers and named selections are very useful ”

“ It's not always necessary to create a 2D sketch for your image, you can start blocking in some general shapes straight away in 3D, as I did in this particular piece. When general composition is ready you can start adding large details, then smaller ones and so on until you reach the necessary level of detail ”

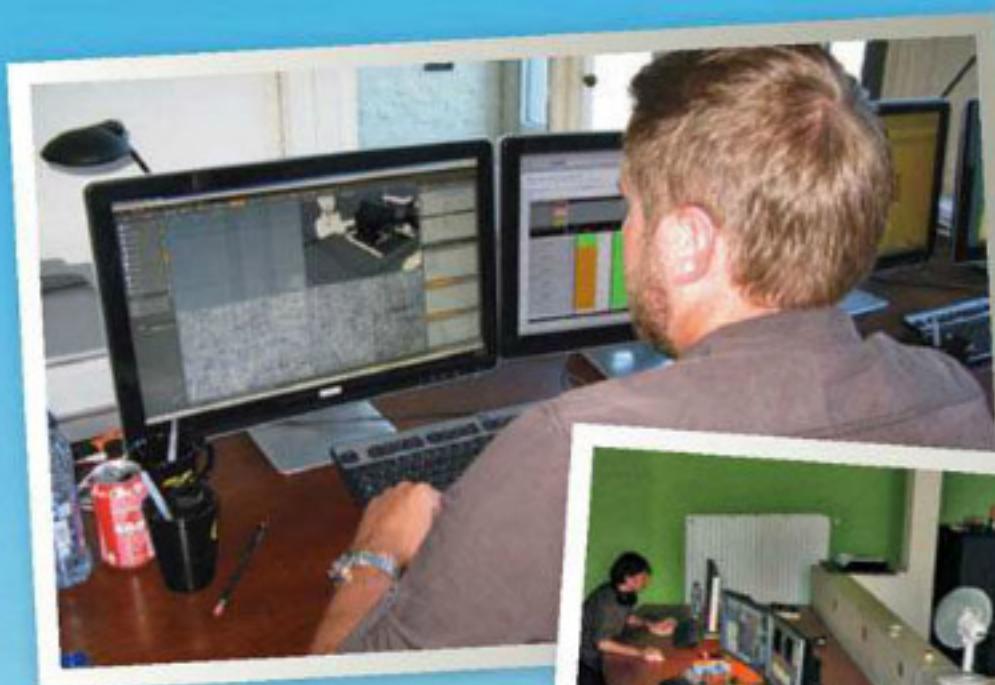


ANIMATION WITH CHARACTER

Chris McMahon talks to the Belgian studio Creative Conspiracy about creating animation in the land where it was born...



Animation with character



"Whether you are from Belgium or abroad, if you're talented you know that CC is a good place to come to," says Luc Van Driessche. "We often recruit people via internships, so that's always a good way to get started"



CREATIVE CONSPIRACY

The conspiracy theory

A studio that focuses on the bright and colourful entertainment of cartoon comedy

Studio Creative Conspiracy <http://creative.be>

Location Belgium

Expertise 3D animation

Key clients Universal Music (Belgium), BP (The Netherlands), Ethias Insurance (Belgium), Kraft Foods (France), Lotus Bakeries (Belgium & France), Entremont Cheese (France)

Company history Creative Conspiracy started nine years ago as the spin-off of a post-production company. The founders wanted to specialise in creating content for feature films and TV series, instead of providing only post-production services. In combination with short-term advertising projects, specialising in character animation, this became a sustainable business model



Tucked away in the picturesque town of Ghent in northern Belgium, Creative Conspiracy (CC) is located in a corner of the world not readily associated with the high-tech glitz of modern-day 3D animation. It may surprise you to learn that the quaint locale is arguably more important to the world of animation than London or New York. It was there, in 1832, that Joseph Antoine Ferdinand Plateau first introduced the principles of animation to the world, with the invention of the phenakistoscope. This was the first device to give the illusion of a moving image to an astonished audience.

“CC is passionate about making the impossible possible and that’s the fun thing about animation – anything is possible”

These modest beginnings haven’t developed into a booming CG industry for Belgium, but there is nevertheless a small and thriving animation business in the country, spearheaded by game developers like AMA Studios and companies like CC. “Creative Conspiracy is the best reference in Belgium when it comes to character animation in

3D,” says Luc Van Driessche, the company’s commercial director. “We provide the best environment to let creativity happen naturally, within a streamlined production process. As such we’re known for producing original and yet commercially successful work and over the years we’ve managed to develop our own style.”

Animation with character

Timeline

We chart CC's success, from small beginnings to big commissions

2003

2003 CC produces 3D character animation for Sylvain Chomet's *The Triplets of Belleville*

2004

2007 *Max & Co*, which won the Audience Award on Annecy International Animated Film Festival

2005



2010 Release of *Clumpies*, an animated TV series for children, distributed internationally by Universal Music and BBC World

2007

2010 Release of *Uki*, another animated TV series for children which has been sold to broadcasters in more than 40 countries

2008



2011 CC's commercials for public transport company De Lijn became YouTube hits, with more than 2 million views per commercial. 'Ants' was voted second-best World Commercial on American network CBS

2010



2011 Universal Music launches merchandising of *Clumpies* and *Uki*, including toys, books and clothing

2011

2012 CC wins Belgian Topspot Award for Lotus Bakeries 'Western' - the most popular TV commercial with the Belgian audience

2012



2012 Opening of Uki Land within Belgian amusement park Bobbejaanland

2013

2014



From small beginnings

The quaint surroundings of Ghent are somewhat reflected in CC's distinct style - charming cartoon creations with an enjoyable, winsome air, easily digested whether in the form of a colourful children's show or an advert for vehicle insurance.

As with most success stories, it grew from small beginnings. CC first opened its doors as a team of just three, breaking off from a larger post-production company in 2003 with the long-term aim of working on its own television shows and feature-length movies.

It had to start somewhere, and although it may not have been its own creation, CC's first job was a prestigious one. The fresh-faced company was drafted in to work on the Oscar-nominated *The Triplets of Belleville* (released as *Belleville Rendez-vous* in the UK), Sylvain Chomet's feature-length animation about a kidnapping, the Tour de France and a pooch named Bruno. The 2D production required some 3D finesse from CC and the feature's European humour would come to inform the company's work from that point on as the team grew in numbers.

"During the years the team has grown steadily to a fixed [total] of 15... sometimes extending itself to 30 artists for temporary projects," says Van Driessche. "Some artists are all-rounders, others have a certain specialisation. Some are more dedicated to animation, others to lighting, shading and compositing and a few of us are good at rigging and all the technical stuff behind 3D animation."

There's one thing everyone shares, though: "Everybody at CC is passionate about making the impossible possible and that's the fun thing about animation - anything is possible!"

However, it's not as easy getting projects off the ground in a locale such as Belgium, as it is in countries better established in the 3D world, says Van Driessche. "Belgium is a small country, so all major 3D studios have to work together with global

“Belgium is a small country, so all major 3D studios have to work together with global partners to get funding”

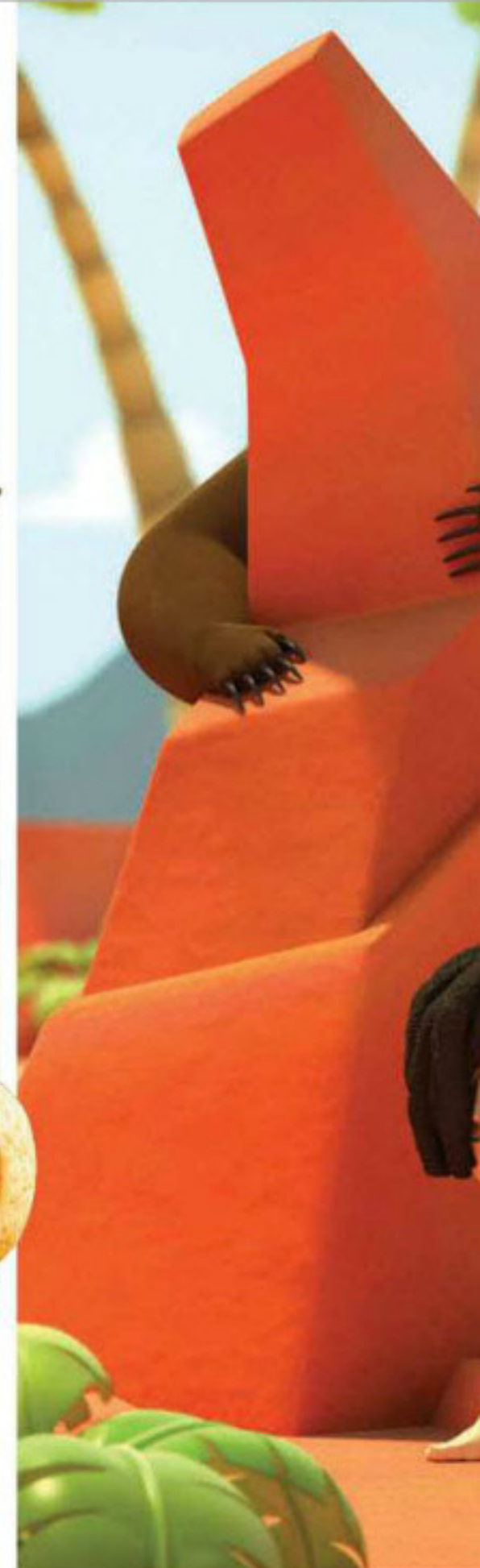
partners to get funding for big projects like TV series or feature films." Though there is some help from the government to develop new content, it's still not an easy process for CC. "Although most 3D movies in Europe have a budget that is about ten-times lower than an animated movie produced in the US,

it's still the time it takes to get a project properly funded that's the biggest challenge."

A recipe for success

Despite the budgetary constraints imposed on CC by its location, the studio has built up an impressive list of credits. CC has worked on a number of award-winning animated children's shows. These include the world-famous *Clumpies*, the pilot for a show about good-for-nothing caveman *Toc Toc* and the CBeebies show *Uki*.

"From the beginning, we wanted to create a concept with good licensing possibilities," says Van Driessche of the show. "When we discovered *Uki*, we immediately felt that this cute yellow creature would be able to please young children. Universal



Animation with character

B



Music Belgium, the international distributor, confirmed our enthusiasm and was willing to invest in the series and merchandise different products.

"Luckily our feelings about the show were right, because just after that *Uki* won the prestigious Pitch It! Award on Kidscreen 2009 in New York. Thanks to that we felt quite confident when the production eventually started."

The main character, *Uki*, was created by Ashkan Harati - a designer from Belgian collective Topfloor - but the character was just the start of the process. "We created a writer's room with people of different disciplines to write the bible of the series and all the scripts," remembers Van Driessche. "These toddlers enjoy repetition, but that doesn't mean you can do the same story 52 times. They also scare easily, because they can't readily tell the difference between what's real and what's fantasy, so we had to be very careful. Our director, Karim Rhellam, was able to create, together with the team, a fun but safe environment for *Uki*, which pleased both children and parents alike."

CC also found a great deal of success with an advert for Flemish public transport company De Lijn, in which a colony of ants group together to bung up a hungry predator's nostrils (see The making of 'Ants', page 47). The advert found success even in the US, with the CBS network voting it the second-best World Commercial in 2011, in the TV special *Clash of the Commercials*.

A CC was chosen by agency BETC to produce the unique commercial for LU Cracottes

B Toc Toc is a new series about a hapless caveman who discovers humanity's great inventions

C Creative Conspiracy has a knack for comic animation, even with subjects like insurance

D "It's... creativity and technical know-how that makes you a good artist at CC," says Gerrit Bekers

Animation with character



E "We [offer] a creative yet workable solution for every challenge," says producer Emily Rammant

I There are over 100 animation companies in Belgium, including the growing AMA Studios

G This ad for Lotus biscuits shows how CC's animators can even imbue a teacup with animation and life



"We invested a lot of energy in this commercial in order to obtain top-notch execution," remembers Emily Rammant, producer at CC. "It's also a great idea, and these two things made it a [huge] success. The commercial was a big hit in Brazil too. Many bus companies contacted us to buy the commercial for their own purposes. We were not allowed to sell the images, but we were really surprised and happy with the attention. That advert got some real YouTube hits in 2011 - more than 2 million!"

How to win a pitch

Advertisements in particular has provided CC with a constant source of income to sustain the business between its larger works. These projects can range from imaginative insurance ads for Ethias, to making adorable wheat, as with the LU Cracottes 'Seriously Crisped' commercial.

"Within advertising, CC is a hot-shop for character animation and usually only works on high-end projects where budgets are still quite comfortable," says Rammant. "This is a long-term

engagement for us, which means that we occasionally have to decline some jobs too. Most of our clients are located in advertising hubs such as Paris, Brussels and Amsterdam."

For Rammant, getting clients interested in CC is simple. "The best way to win a pitch is to produce a little piece of the work and give the client a glimpse of what they're going to get if they choose you. We also explain the way we work and the different steps of our production process. Also important is an open relationship with transparent pricing for existing clients."

Creative Conspiracy has also worked on a number of feature films over the years, but due to the budgetary constraints of the locale they're collaborative efforts with other studios. In 2009 CC worked with fellow Belgian production company Nexus Factory to create *The True Story of Puss'n Boots* (not to be confused with the 2011 DreamWorks film), and in 2007 it once again collaborated with Nexus, Télévision Suisse Romande, 2B and Mig on stop-motion feature *Max*



The making of Ants

CC's producer Emily Rammant talks us through the creation of the successful advert, 'Ants'. Following a progressive scheme, ten stages needed to be completed, with each being approved by all parties involved



1 Script The idea for the campaign came from advertising agency Duval Guillaume Modem: it says it's smarter to travel in groups. We made a similar commercial with them three years earlier, about penguins being attacked by an orca whale. This time, the agency wanted new opponents, so we came up with ants versus an aardvark



6 Blocking animation and 3D layout Based on the 3D animatic, a 3D layout was created. The 3D scenes were assembled, camera positions were determined and the animators started moving each character. The characters were... animated in Maya using key poses to create a global view on the animation timing, action and expressions



2 Character design We presented different 2D designs in order to give the agency a choice of different artistic directions. Realistic footage was used as a reference for the designers



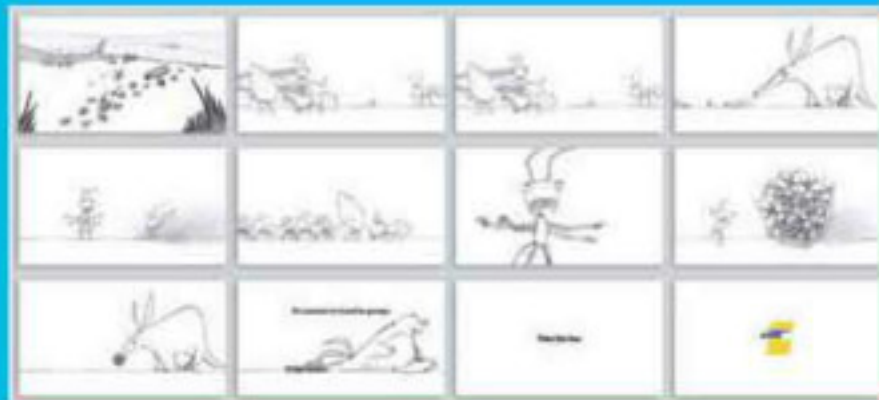
7 Lighting While the blocking animation was being done, the lighting and layering of each shot was added in modo



3 Modelling, texturing and shading After approval of all parties, the 2D designs were transformed into 3D models using modo. For the ants, we created a variety of characters based on one model



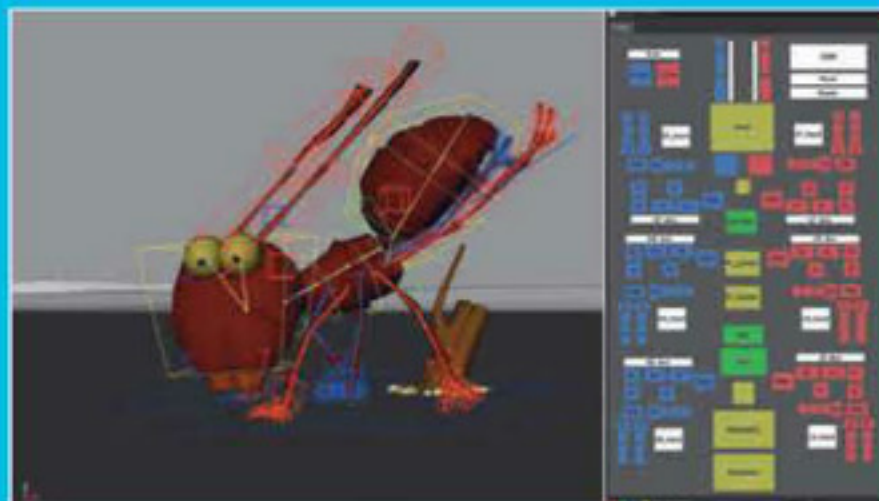
8 Refining animation When the blocking animation was approved, the animators refined their work. It's only then that the audio track was launched. We always used project-specific sound effects, recorded in a specialised Foley recording studio - a technique now rare in advertising, but we keep it alive because of its added value



4 Animated storyboard While the design of the characters and sets was being done, the script was transformed into a storyboard to determine the length of each shot and the timing of each action. These images were used... to help with the visualisation



9 VFX The VFX were generated on the locked animation. In this case, we added some dust particles to the scenes



5 Rigging, setup and skinning We created a set of tools to animate the 3D models in Maya. The expressions of the faces were added via BlendShapes and corrective morphs



10 Rendering and compositing Once all the animation, lighting and VFX simulations were ready, they had to be calculated in modo, generating several output image layers. During compositing, all rendered layers were brought together in Fusion

Ray & Ruby, which is currently in production, is for a slightly older audience than Uki, aiming for the six-to-nine age range

Uki was created for young children - it's a simple, pastel-coloured world, showing how CC is able to create for a young audience

Animation with ch

+

“The animator should really get to know their character in order to give it the right feeling”



CC's KBC ad shows that it's just as comfortable working with real-life plate photography as it is with full-3D environments

Klumpies is a collaboration with other companies within Belgium, in this case Frabrique d'images and Nexus Factory

"Most people here have experience in VFX... but it's more rewarding and motivating being able to create your own content," says Gerrit Bekers

"We often need to overcome technical issues," says Bekers. "The only way to solve... these issues is to invest enough in research"



& Co, which won the Audience Award at the Annecy International Film Festival.

As for future feature film work, "CC is working on different concepts for feature-length films for the moment, but due to financial reasons we might need to co-produce them with other European studios," says CC's creative director Gerrit Bekers. "However, first we need to get our concepts right. These things take some time. Luckily, we're not in a hurry and we are able to give these projects the time they need to ripen."

Van Driessche is happy to go into slightly more detail: "Our main goal is to produce interesting content. It's a fact that animation works well for children, so many of our concepts are for this target group. However, we are also developing a feature film for a broader age group right now. I can't reveal much yet, but it's something within the science fiction universe."

The key to good animation

Still, cartoon imagery remains CC's focus, no matter the project it's working on. It's what the company does, it's what it loves and this is surely a winning formula for creating great productions. "It's very simple," says Bekers. "Cartoon animation is the



A big year

Creative Conspiracy has had a successful 2012, winning a number of awards, notably for its De Lijn 'Ants' commercial, which was first awarded second place in CBS's *Clash of the Commercials* special. It then won Gold on the Creative Club of Belgium Awards 2012 and finally has been made part of the official selection for China's International Animation and Digital Arts Festival. 2012 has also seen CC's Lotus Bakeries 'Western' advert win a Belgian VTM Topspot Award and Belgian theme park Bobbejaanland open a special area dedicated to Uki.



'Western' was produced by CC, along with directors Steven De Beul and Ben Tesseur from Beast Animation

most fun animation there is!"

The company has a flair for taking simple, cartoon-y caricatures, be it a stumpy human figure or a skittering crab – or, in one case, a teacup – and instilling it with a real sense of personality. "The key to good animation is timing," says Bekers. "It's not only about the timing in the story – a climax, or a break in the right mood when it's needed – but also about the timing of the character's movements. The animator should really get to know their character in order to give it the right feeling or emotion. An in-depth character description for the animators is very useful in that sense."

Creative Conspiracy uses several different software packages in its pipeline. Modelling, texturing, shading and rendering is done in modo, sculpting in ZBrush, setup and animation in Maya and compositing in Fusion. "We use custom scripts to allow us to work comfortably with Maya, modo and Fusion," Bekers adds. "A lot of these scripts are used to eliminate the tedious jobs of importing and exporting from one application to another."

As for keeping tools and staff up-to-date, being aware of the next big thing is key, even if the team isn't going to jump on it straight away. "We're beta testers for some applications, so we're aware of what's coming next, but in general we're not the kind of studio that's eager to use the latest and greatest plug-ins and gadgets," says Bekers. "We only switch to new stuff when it's really useful and we're sure we can rely on it in production."

For Bekers, the biggest changes coming over the next few years are already being seen in industry greats like Pixar. "Right now I have the impression that the biggest evolution coming in the industry will be from clothing and hair simulations – like in *Brave*. In the coming years we also hope to see real-time render engines improve and particle systems become more user-friendly."

What of the future for CC? "Our intention is to keep providing a stable work environment for great artists," says a proud Van Driessche. "Of course, the company will grow in the years to come. Let's hope we'll have a few feature films and new TV series on our track record by then."

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I made this...

Incredible 3D artists take us behind their artwork

Artist info



Rudolf Herczog

Website www.rochr.com

Country Sweden

Software used CINEMA 4D, Maxwell Render, Photoshop

Bio Rudolf has been freelancing for six years, specialising in sci-fi and architectural visualisations

“Knowing where to start is not always obvious. In this case, I [had] a reference shot of the central dome as a starting point, and used that as a scale reference upon which everything else is based”

Software used in this piece

CINEMA 4D

Maxwell
Render

Photoshop

Országház 2012

I was born in Budapest, Hungary, and have always had a soft spot for this particular building with its majestic appearance. I'd never seen a 3D model of it, so a few years back I decided to make it a personal challenge to build it in 3D. I never got around to finalising a scene with the model at the time, but after picking it up again I achieved this final result.

x

“Keep an eye on the poly count! It's easy to get carried away with detail work that at the end won't be visible. When reworking some of the segments I managed to reduce the poly count by a factor of ten, without noticeable changes”

“ Most of the techniques used for the scene were very simple: the building is mostly made up of primitives and Booleans; the entire scene contains five simple materials and I used the sun as the only light source ”



“ Whenever taking on large-scale modelling, the massiveness of a structure can feel overwhelming at first, so I divided the building into segments, as if each was a separate project, and focused on one part at a time ”



Learn how to

- ✓ Model sci-fi elements
- ✓ Texture landscapes
- ✓ Light your scene effectively

Software used in this piece

ZBrush

Photoshop



Concept

The concept was initially created on a sheet of paper. I later took a photograph and continued working on it digitally. At first I thought it would be a horizontal work, but it turned out that it would look better in a vertical position.

Sculpt an epic sci-fi terrain

Secret place 2012

“Work exclusively within ZBrush to build all the object elements, then move on to Photoshop to perfect your render”

Tomasz Strzałkowski is a CG environment artist and art director

The idea for this project was to create an alien landscape. One evening I was making sketches on a sheet of paper when I came up with an idea of a deserted spaceship, or maybe only its engine. In fact, it looks like a skeleton of a gigantic, extinct animal. Was this animal specially adapted for the creation of a huge machine or was it a product of evolution? Or maybe it's something else? I have my own personal opinion but I prefer viewers to make

their own minds up.

In this tutorial I will explain how to create an otherworldly landscape using ZBrush. With this one program you can complete the modelling, create your own alphas (used to model the scene by texturing), create materials, set up the scene, choose an effective perspective and lighting, and even make your final render. The compositing and colour correction will be finished up in Photoshop.

Step by step
Easy-to-follow guides take you from concept to the final render

Artist info



Tomasz Strzałkowski

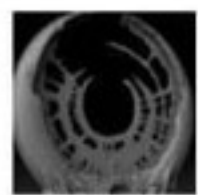
3DArtistonline
Username: Tomstrzal

Personal portfolio site
www.tomstrzal.com

Country Poland

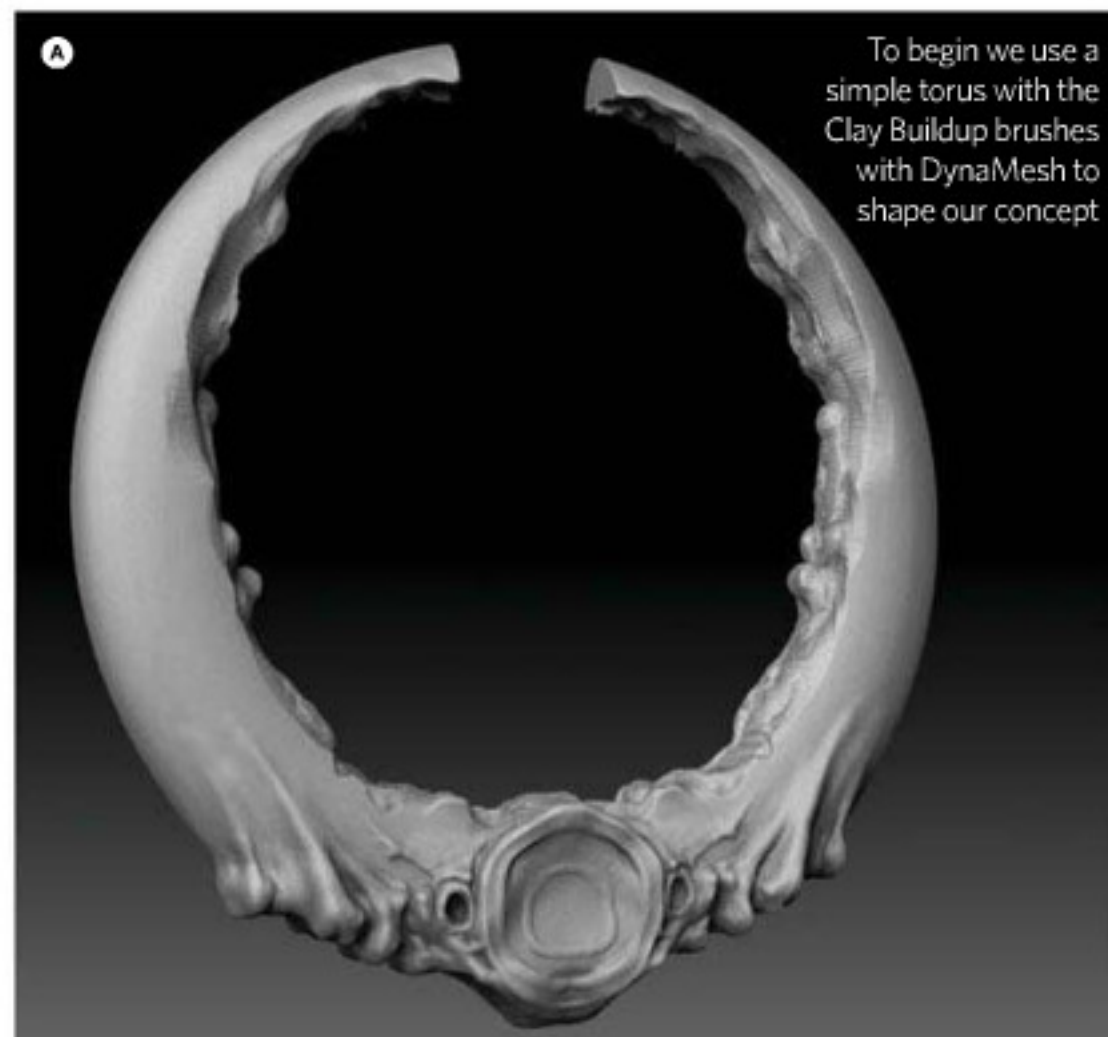
Software used
ZBrush, Photoshop

Expertise Modelling, texturing, lighting and rendering.



Model the foundations

Start with a very basic outline of the whole scene, using simple models

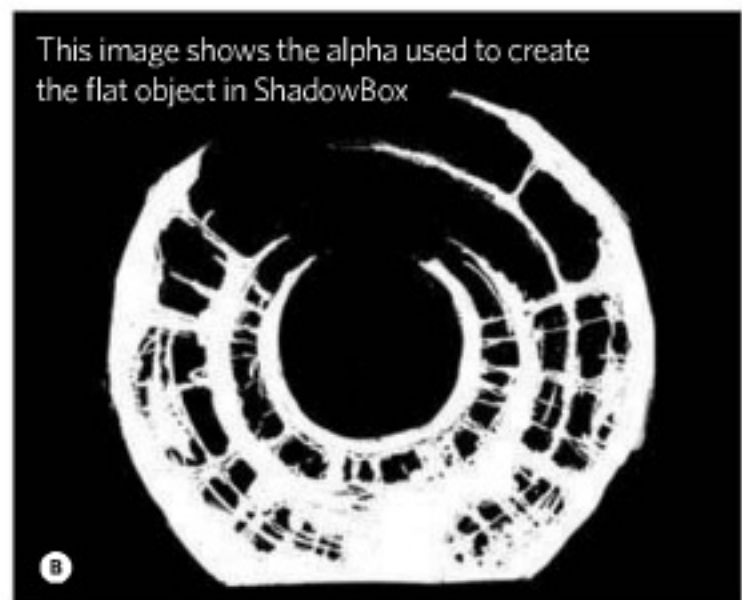


01 Create a base mesh First we will make a base mesh. The first of these is a model of an exterior object similar to skeletal ribs. Use a torus as a base mesh, then the Clay Buildup brush and the DynaMesh tool in ZBrush. Try to make a structure similar to that of the concept. At first it may all look clumsy, but the main idea is to create some base meshes that can be used later to construct the scene **A**.

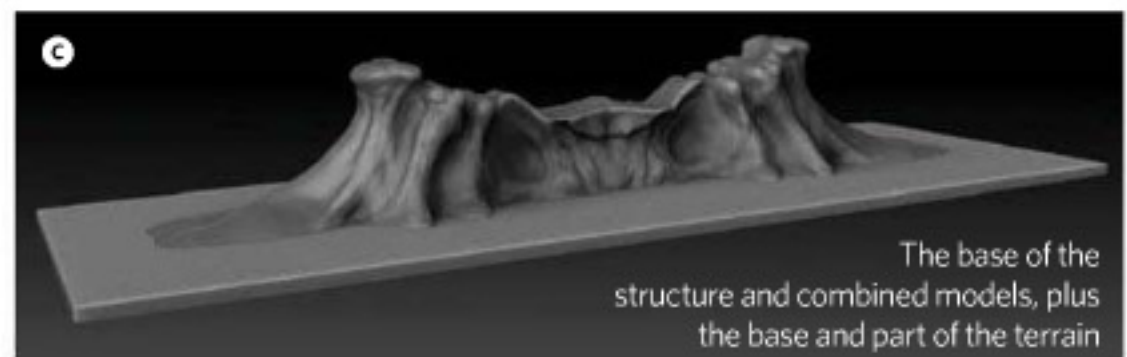
To begin we use a simple torus with the Clay Buildup brushes with DynaMesh to shape our concept

02 Shape the inner circle

In order to get a better 3D preview, try to put together most of the main objects of the scene in the early stages. Next create the inside of the circle. Use the concept to create an alpha with the shape of the interior, then the ZBrush tool ShadowBox to get a flat object, which is a great basis for further modelling later on **B**.



This image shows the alpha used to create the flat object in ShadowBox



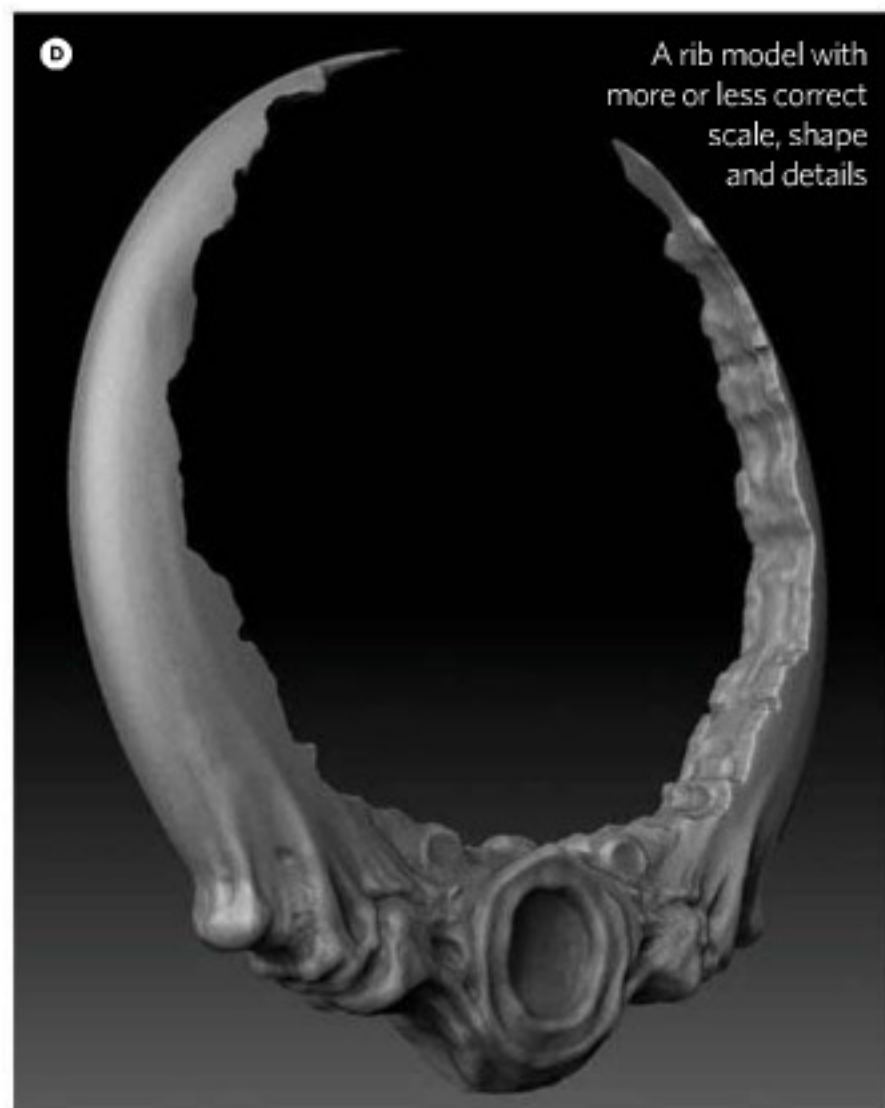
The base of the structure and combined models, plus the base and part of the terrain

03 Build the basic models Now we'll create the models for the rest of the objects. The base of the circle is modelled with the Clay Buildup brush and the DynaMesh tool. Add a flat box, emulating the ground. Now we need to think over how many parts the main model will be made up of and divide those models in order to get the best quality. It's also crucial that the base is joined with the ground to have a better and smoother transition between the main structure and the ground **C**.

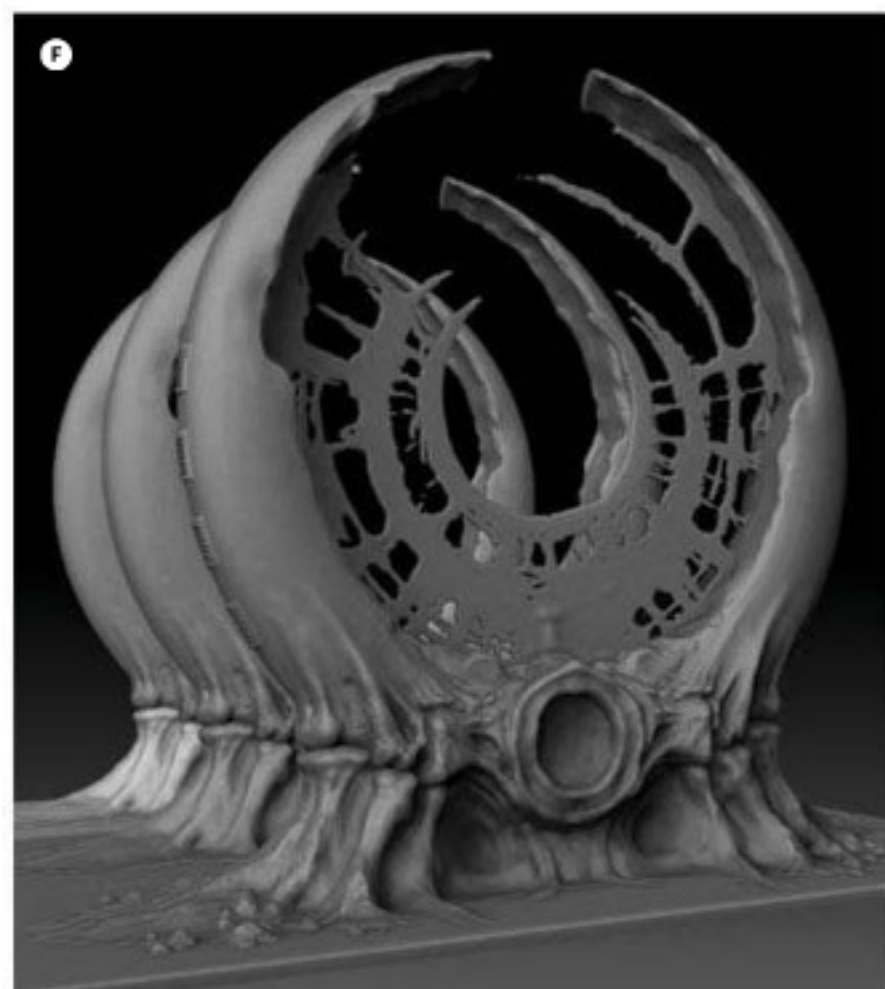


Add some alien detail

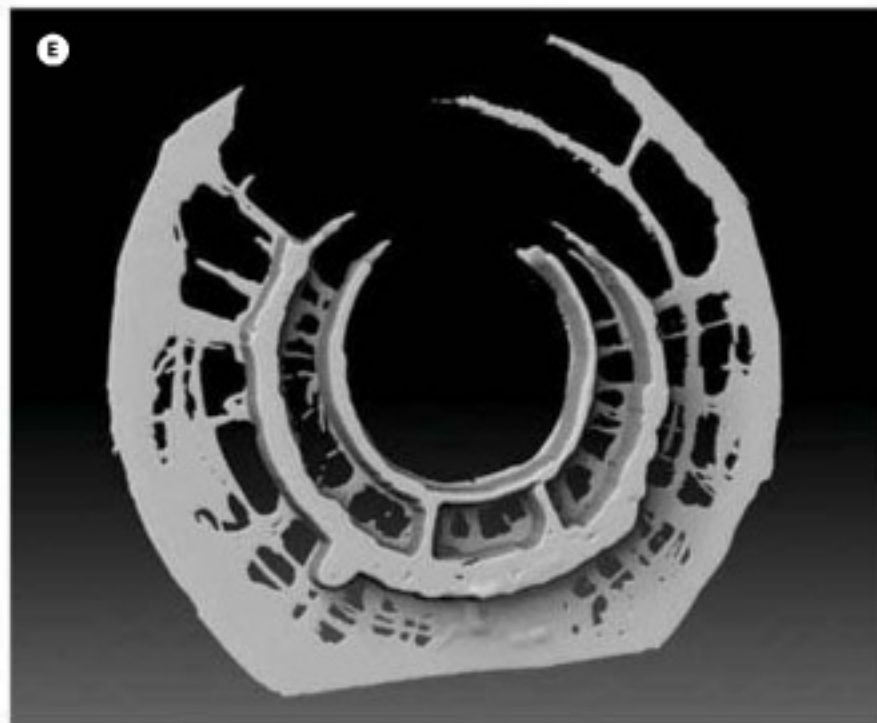
Distribute your key features to convey the image's story



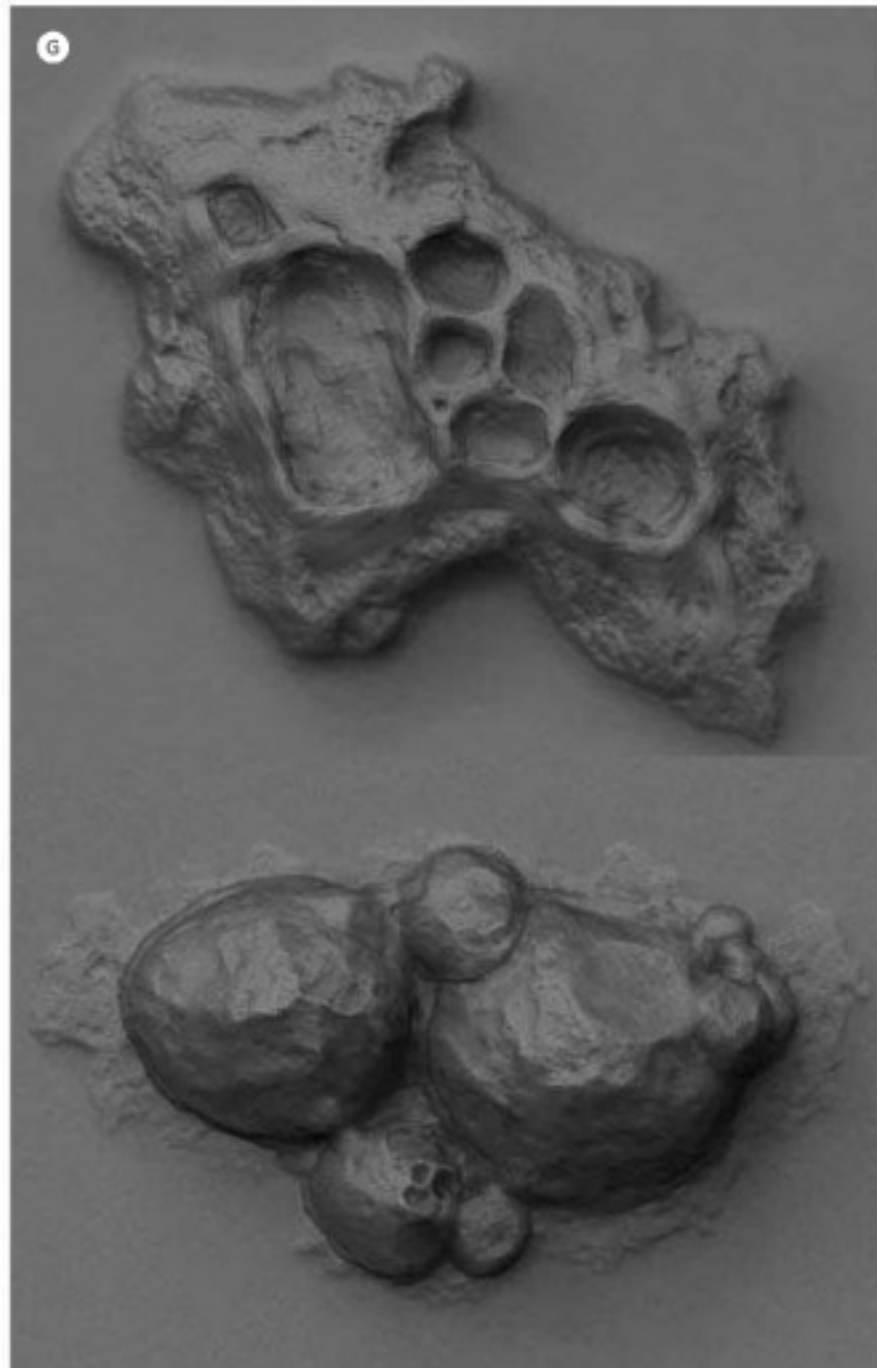
04 Make broad sculptures The main element, which looks like a spine with ribs, needs an appropriate scale with the thickness of the ribs. It's also important for it to look good in the target perspective. It could be that the ribs of the structure contain engines to propel the ancient ship, so they need to be strong and have a secure physical connection to the main spine **D**.



06 Duplicate models to check scale When we have the shapes we want, it's time to copy the objects and put them in a scene, taking the perspective, camera and layout of the objects in relation to one another into consideration. This enables us to tell whether the applied changes are good enough and if the main shapes are close to what is needed. This is a good habit to adopt, particularly when making epic scenes like this **F**.



05 The mechanical inner circle After confirming the shape of the exterior object, it's time to add details to the interior object of the structure. We want the object to have the right thickness and for it to consist of several layers. It needs to look like a corroded and crushed interior of an engine. First paint a mask on this object, which is needed to extrude its thicker sections. Next, use the DynaMesh tool to improve the topology. Add medium and small detail using the prepared alpha base and hand modelling **E**.



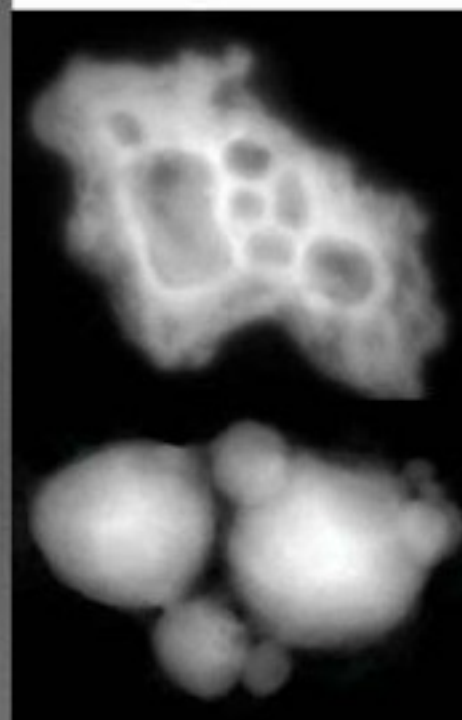
07 Model detail and create more alphas Now the main shapes are sorted, it's time to apply more detailed modelling. Alphas that we can extrude in the object will be very helpful. You can make them yourself very easily within ZBrush. All you need to do is model a suitable shape: go to Projection Master, use the MRGBZGrabber tool and you will have an alpha ready to add to your main model **G**.

Bring detail, composition and the right view

In all my work I keep all the used elements, such as alphas modelled in ZBrush, which I can use for future works. I also create the alpha and brush bases. I try to put together the scene as quickly as possible and do the rendering so I can see how particular shapes look. This way I can also see the details in the composition as a whole. In the early stages I try to put the camera in the right position and choose the best perspective in such a way that I can see how much work is needed for each element. Frequent rendering helps me see the whole picture and enables me to decide whether I'm going in the right direction. During such tests it often turns out that there is a lot to be corrected and new ideas will come to you. The concept is only a starting point and I always hope that the final effect will be better and surprising.

D The inner circle model before extrusion and after extrusion with medium detail

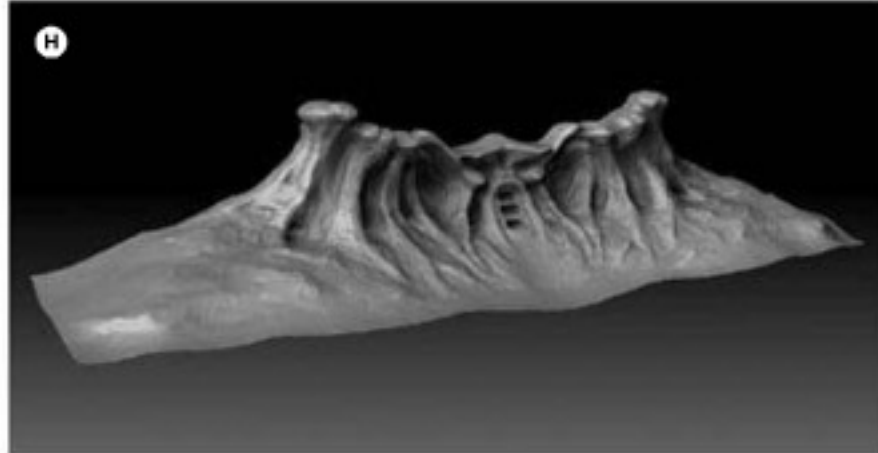
F The scene with all the base models. This is helpful when planning the next steps



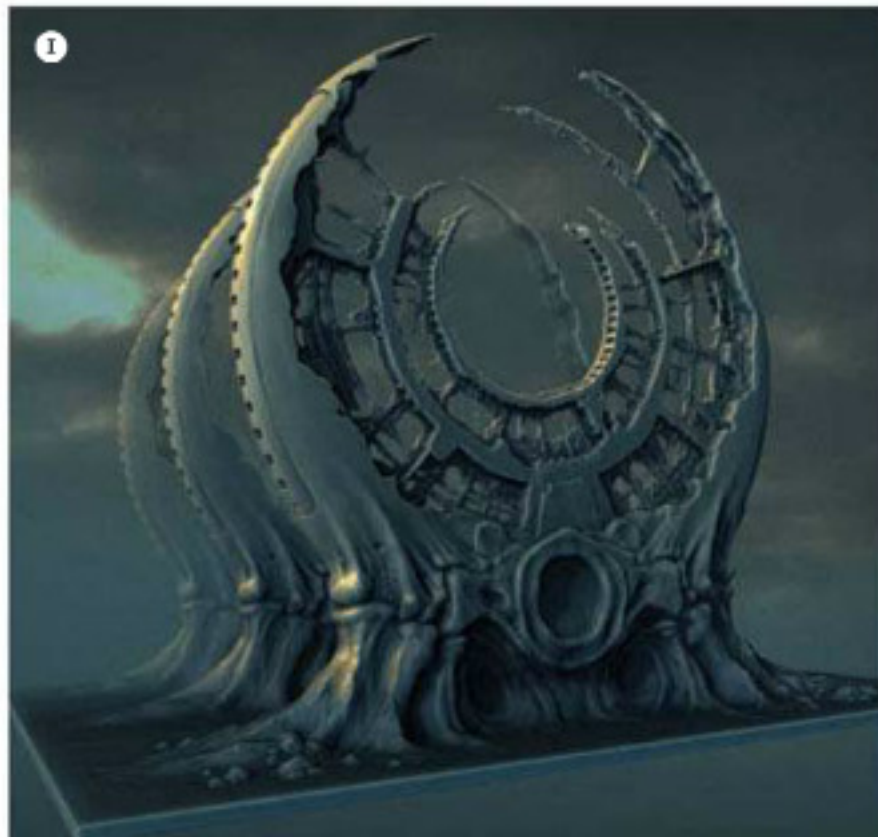


Unify your elements

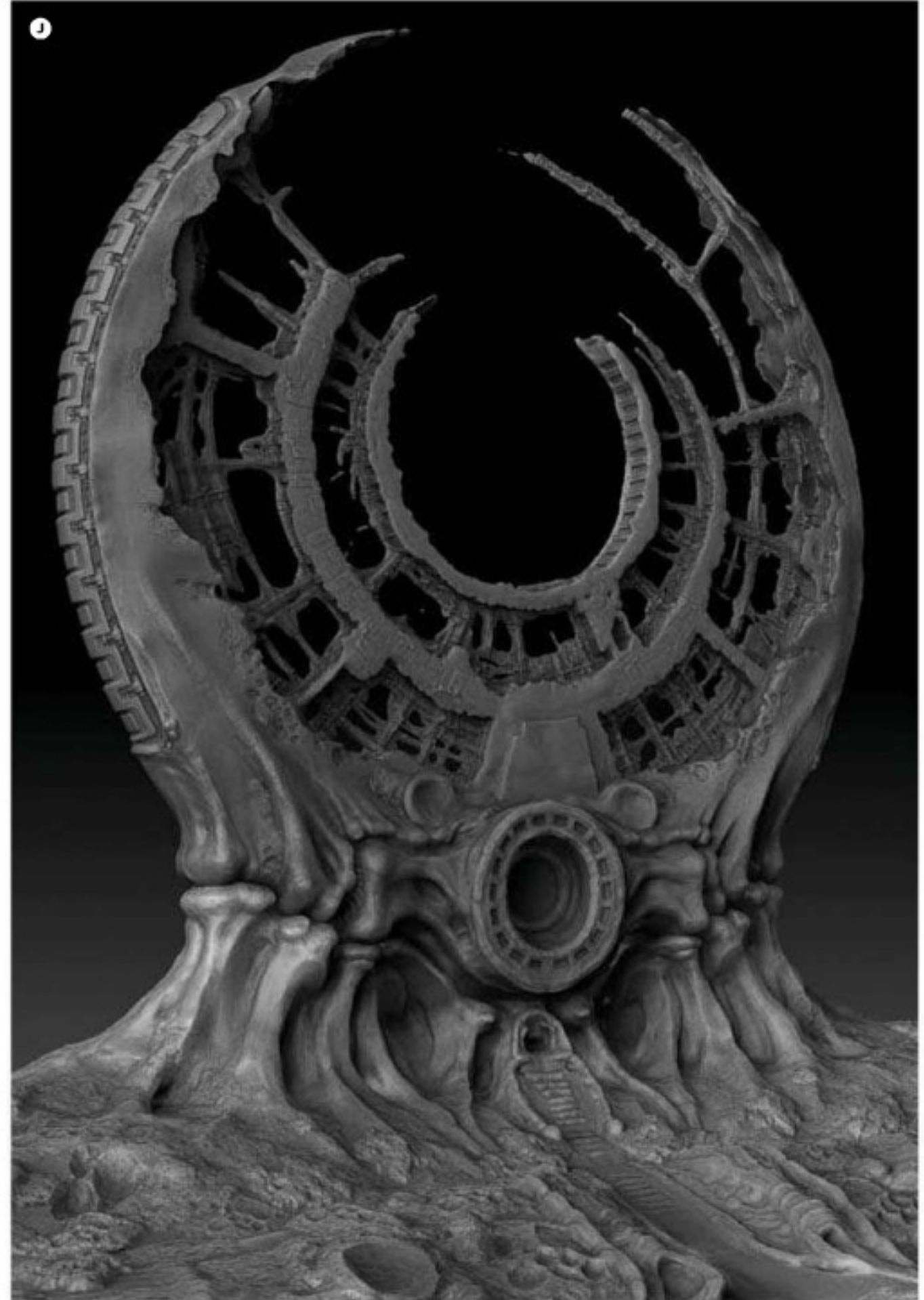
Join your terrain and alien craft, testing all the way



08 Begin to blend the sections The base will also need the right shape and ratio; the initial concept was to have the base flatter, but as you can see both the terrain and the base both ended up being slightly raised. The base has to be constructed in a way that will enable us to join it with the rest of the terrain in the foreground later **H**.



09 Test the lighting and colours The lighting and the climate of the work are very important, which is why during test rendering you should always consider their direction, colour and brightness. The background is also crucial, especially its colours and in this particular case the fog that occupies it. This fog's thickness and colour has a great influence on the whole work **I**.



10 Connect the wide terrain Despite having quite a precise idea about the work as a whole, we should still look for the best shapes and details. Constantly make tests of your progress to ensure every element is working. A good example is the elements on the edges of the exterior objects or the details of the terrain joined to the base of the construction. Adding a few figures at the base of the object can show off its scale in an impressive way **J**.

Stick with the process

Usually the first steps go very quickly if you have a vision, idea and a concept you've drawn yourself. Unfortunately, making the final decisions requires many tests and changes. Most difficult are the details and their layout. It's often the case that a considerable part of the work is inadequate and you have to start all over again, but this is what the creation process is all about. When you finally achieve the expected outcome, it's very inspiring and gives you the energy and motivation for further work.

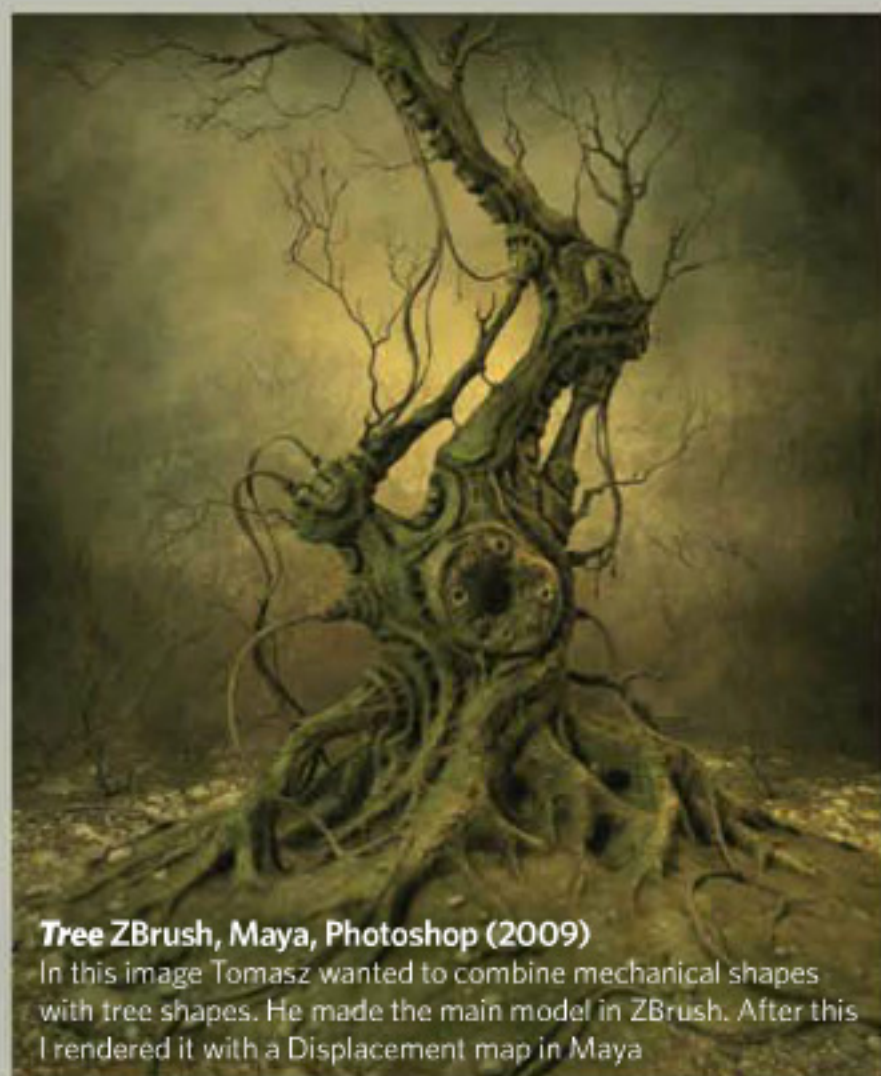
- G** The plane with the modelled shape and alpha
- H** The new base shape. Prepare for better transition between this object and the rest of the terrain
- I** Test renderings with ideas for lighting and colours
- J** Terrain joined with the base model and the structure



Artist Showcase

Tomasz Strzałkowski

Having worked in the games industry for over ten years, Tomasz is experienced in creating environment graphics, working from a young graphics artist up to an art director. He has been educated in painting and graphic design, but he always wanted something more: he wants to bring his art to life!



Tree ZBrush, Maya, Photoshop (2009)

In this image Tomasz wanted to combine mechanical shapes with tree shapes. He made the main model in ZBrush. After this I rendered it with a Displacement map in Maya



Roots ZBrush, Maya, Photoshop (2009)

In this image he continued the idea of Tree with a combination of mechanical and organic shapes, but with a different point of view. Unlike with Tree, he created this main model in Maya



Tree Branches ZBrush, Maya, Photoshop (2010)

Tomasz had many parts and models from Roots that he wanted to use again. Here he used the same techniques that he learned creating Roots



Form the surfaces

Inject mood and atmosphere



11 Test BPR rendering and composition

Having modelled the whole work and a series of initial simple renders, we now need a more accurate render with the right camera position and perspective. At this stage, try to choose the optimal direction of the main lighting and select the best rendering values. Thanks to the rendering being completed in layers, we can create a file in Photoshop where all the layers can be put together properly

12 Begin texturing with the Spotlight tool

When the objects are ready, begin to texture using the Spotlight tool in ZBrush. Obviously, even after the texturing, some changes will need to be made to the model, though hopefully these will be minimal. We'll use several textures that will be manipulated to give us complete control and introduce some quick changes, even if there are changes made to the geometry

Always test the project

Frequent testing in the target environment and the climate of the work is key. It means arranging and rendering layers with the lighting, shades, depth and colours in Photoshop. You also need to find the right climate. It's often the case that even the smallest changes have a very big influence on the whole work. When I am approaching the end of a project, I often take a long and careful look at the image, trying to find mistakes and thinking about how I can improve it. Any changes made from now on are very thoroughly thought over. It's a difficult stage of the project because you have to know when to stop and finish it, rather than forever making hundreds of small changes.



13 Modify materials Now we'll begin selecting the materials. The materials of the main structure, the terrain, some technological elements inside the main circle and on its edges are all a little bit different. In order to increase the details, add noise on the terrain in the foreground and try to select the right values, such as Specular, Ambient or Light Cavity

K The test render. Put all the layers together in Photoshop with the correct aspect

L Models after texturing. There will be further changes to be made, which are relatively simple

M Here you can see the difference between the various materials



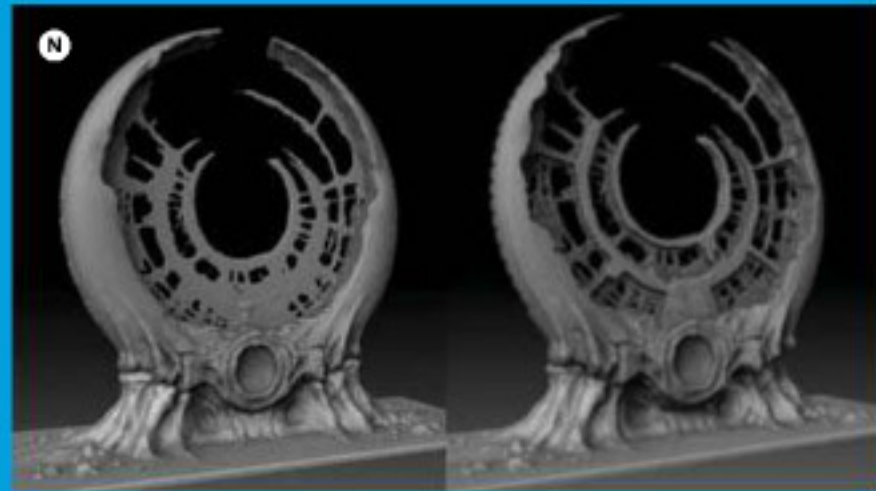
Work towards rendering

Refer to your concept and reflect on your aims

20+ hours
creation time
Resolution:
3,948 x 5,000

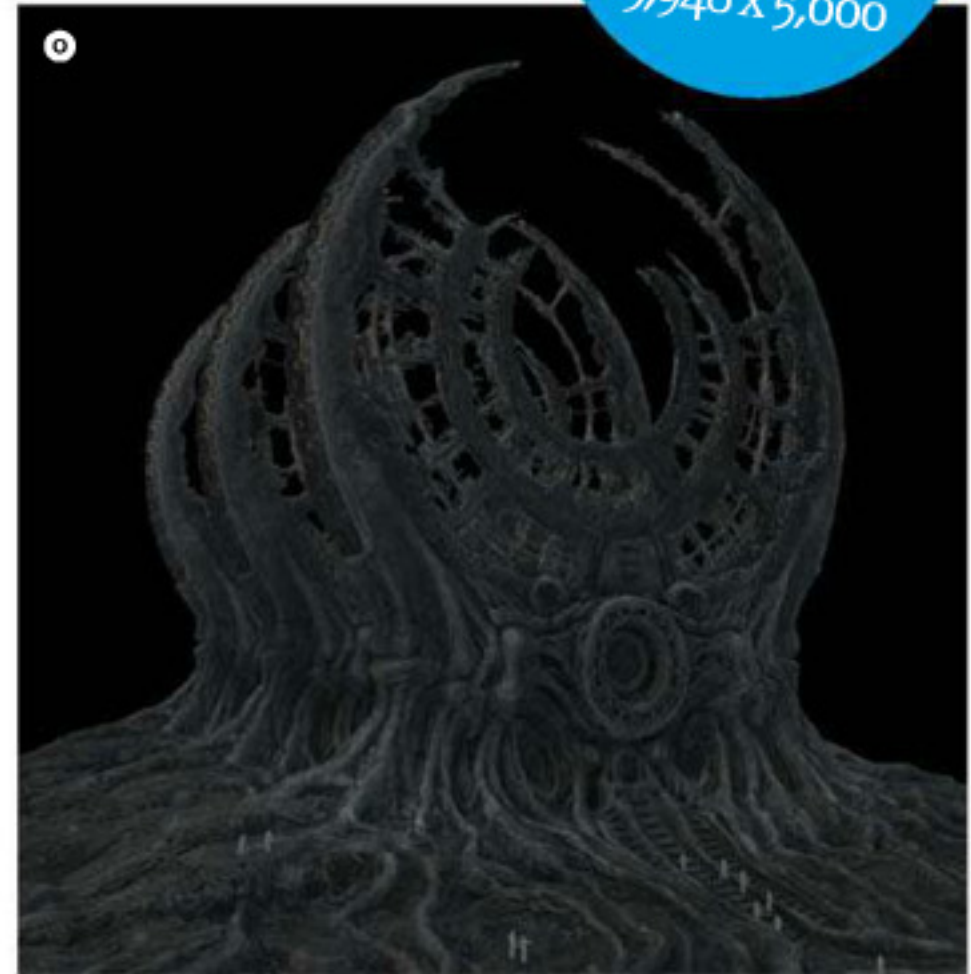
Look for the best shapes

The outline of a concept created by our imagination is often the right one, but it's very difficult to find the best way to implement it. On the other hand, it's a very exciting process because it requires you to fulfil a vision that comes from within. Until you find the right version, use one that will make you feel satisfied, at least for a short while. Although the picture in your imagination is vague and it often changes, you will finally find the right shape and you will feel it. It's an inspiring moment!



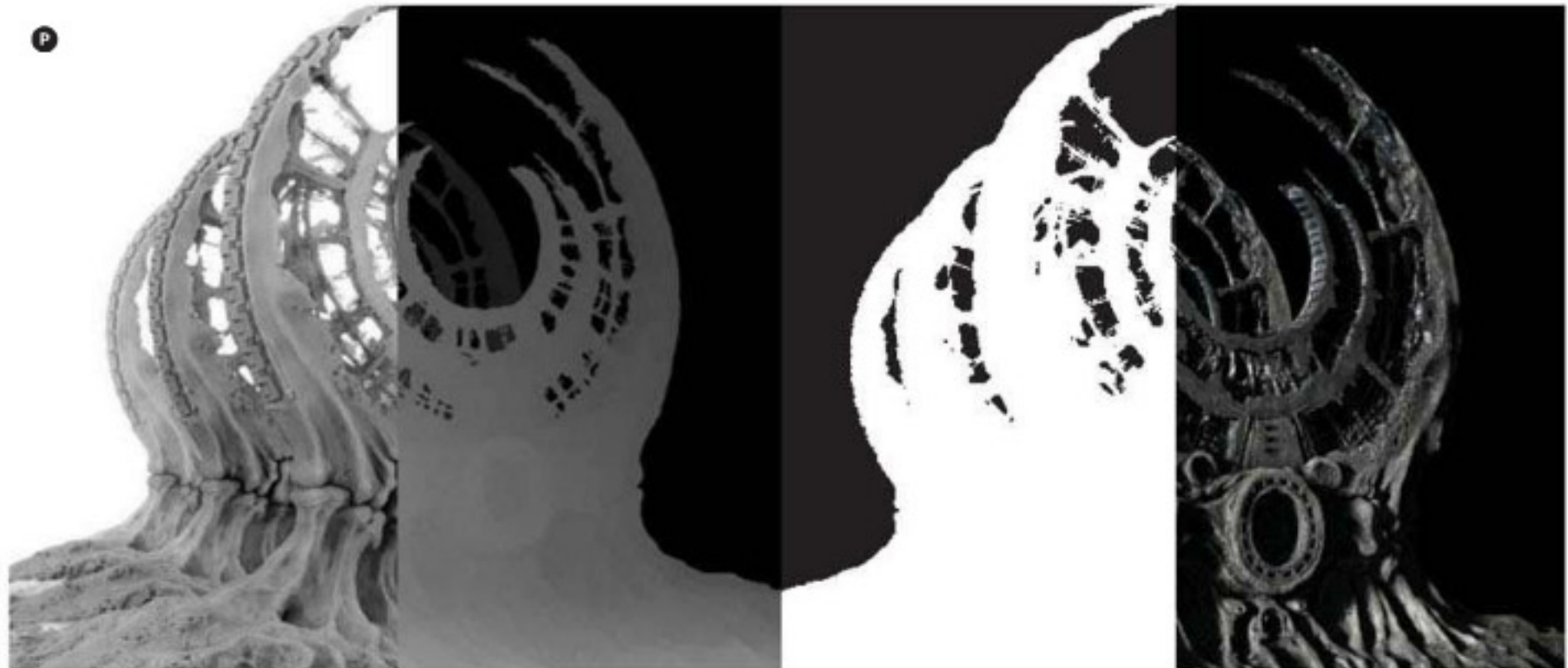
14 Adjust the main lights

The primary lighting, the complementary lighting and the ambient lighting should all be rendered separately and only then combined together in Photoshop. In ZBrush you can get a very nice ambient lighting by loading an HDRI map and clicking the LightCap icon. This way we can get the collection of lights arranged in the space, the same as in the HDRI map. You can edit each one of these lights individually in order to get the exact mood you want.



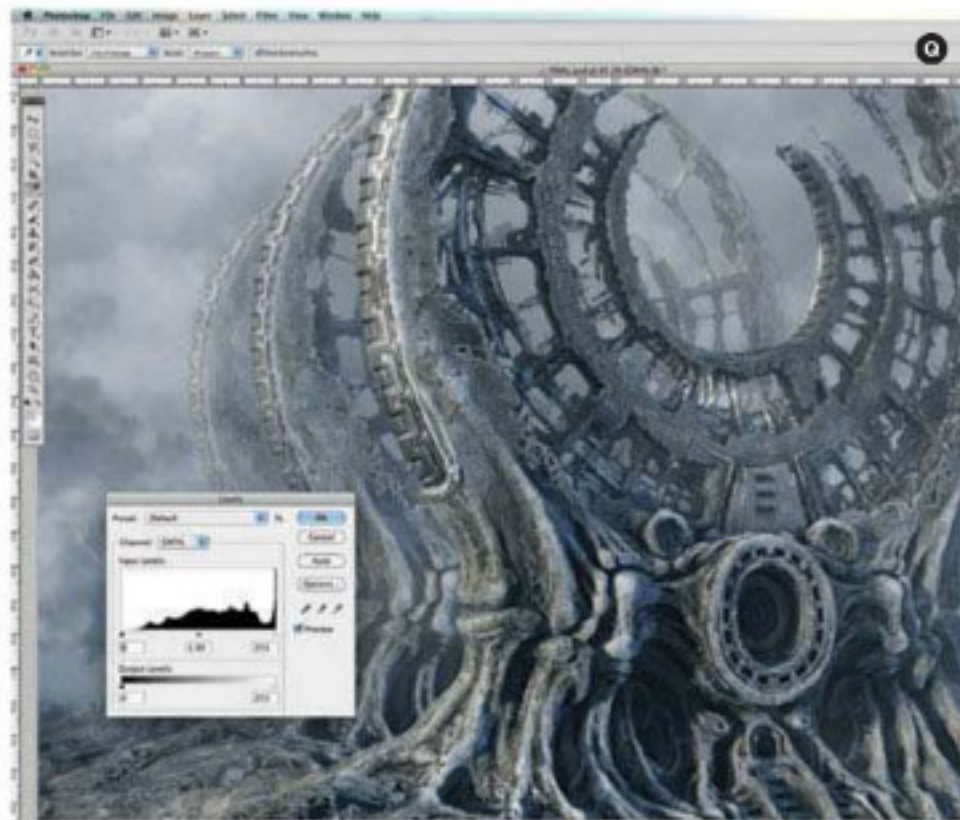
15 Begin the rendering step

After frequent rendering tests it's now time for the final rendering in high resolution. In order to do it, first create a ZBrush project, save all the rendering values and put the camera in the right position with the perspective you are aiming for. Next, load the object. As mentioned before, we will render in layers, which enables us to put them all together in Photoshop. There are several separate layers for the lighting: Ambient Occlusion, Mask, Depthmap and finally the Light Cavity.



16 Move to Photoshop for the compositing

Photoshop enables you to put all those different layers into one final picture. Manipulation of the layers gives you a range of great composition possibilities. You can also create and add a background, fog effects, as well as correct the colours. This is the stage when the work acquires the right climate, and is finally refined and finished off.



Final thoughts

As is often the case when creating original images, I came across many problems, and while I was looking for solutions I learned a lot of new techniques. If you want to achieve a desired effect, you have to go for that goal whatever the problems – technological or inspirational – you may face. With the right amount of work and involvement, most problems can be solved and each and every obstacle you overcome will teach you something new and increase the range of your skills. I hope you've enjoyed the tutorial and take some inspiration from it.

N The main model and changes made during the whole process

O The model lit by an ambient light. Use an HDRI map and the LightCap tool to achieve it

P Rendering layers: Light, Ambient Occlusion, Mask, Depthmap and Light Cavity

O The final image after compositing in Photoshop with post-processing

I made this...

Incredible 3D artists take us behind their artwork

©Plushy Feely Corp

Artist info



Jonatan Catalan Navarrete

Website www.jonatancatalan.com

Country Spain

Software used 3ds Max, Maxwell Render, Photoshop, After Effects

Bio Jonatan is a Valencia-based lighting and shading artist. He also works with sets and props as a freelancer.

Software used in this piece

3ds Max

Maxwell
Render

Photoshop

After
Effects

“The grass is one of the most important parts of the scene, as it is almost 50 per cent of the image. Keeping in mind the idea of the graphic style, I tried to create a highly stylised grass with the help of subsurface scattering”

Kimochis World 2011

This is a new image from the world of Kimochis. I worked hard to find a spot between the CG look and the clean shapes of the 2D illustrations. I hate the plastic and cold CG look; my goal was to render this in a warm and sweet style.

x

“I used Maxwell Render, which enabled me to take control of the bounces and play with the light to get very vivid colours. Also, the use of shaders with subsurface scattering in the sandbox and other objects was a big help to remove that cold feeling typical of CG renders”

“ The Kimochis' world is made up of very basic shapes and flat colours without textures and not very complex shaders. My goal was to find a style closer to the 2D illustration than the typical CG render, so the colour and lighting was extremely important ”



“ The Kimochis, the funny characters you see in the scene, are part of a Plushy collection for children, so I had to make sure the modelling was kept simple, but with a lot of work on the expression to define the character. Classic manga references helped me to define the style ”

The studio ● Create detailed destruction

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info



Paweł Podwojewski

Personal portfolio site

www.behance.net/simonhc

Country Poland

Software used

3ds Max, Photoshop

Expertise Paweł specialises in lighting, compositing and post-production work

Learn how to

- ✓ Model using photographs as reference material
- ✓ Organise modifiers for optimal and fast modelling
- ✓ Create destruction with MassFX in 3ds Max
- ✓ Shade and light scenes
- ✓ Use the Cloth modifier
- ✓ Finish with post-production in Photoshop

With the Disc

• Final chair model MAX file



Learn to spread a unique destructive effect over your bespoke scene assets

LEARN TO DEMOLISH
Use MassFX for quick results

Software used in this piece

3ds Max

Photoshop

Create detailed destruction

Hot chair 2012

“ Learn effective modelling techniques and a full rendering workflow all inside 3ds Max without any additional plug-ins ”

Paweł Podwojewski is an architect and CG artist

Here you will learn how to build a very detailed wooden chair in 3ds Max, a special piece of furniture that has a burnt effect, inspired by the 2004 'Smoke' art collection by Maarten Baas. To create a similar effect we will use modifiers for better control.

We will light and shade the scene using mental ray and create some destruction with MassFX. To finish we will add extra details using the Cloth modifier. Saving some extra render elements, you will learn how to enhance the results using Photoshop for extra DOF and volume lights.

Concept

The idea for this scene was inspired by the Maarten Baas collection, 'Smoke'. The furniture has a burnt effect I thought would be an interesting focus to build a bigger scene from. With just few additional models I have been able to create a scene full of destruction! The model we'll create can also be a nice touch for any interior to bring a unique, minimalist style.

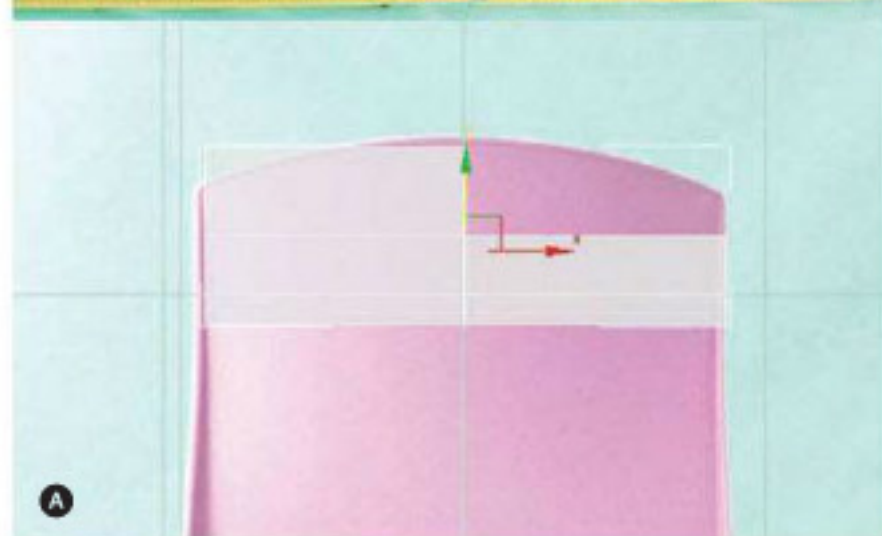


Basic modelling

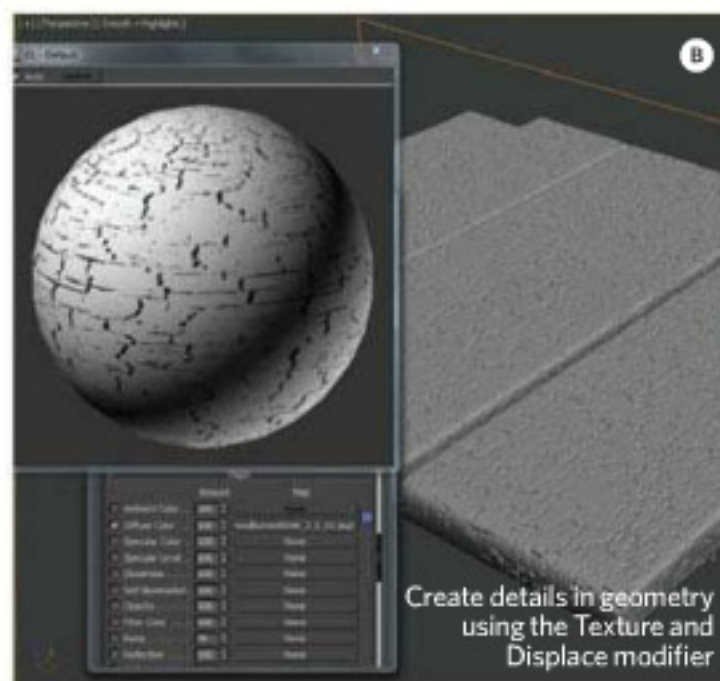
Start to build the main object in 3ds Max



Begin the model with a low-poly structure. Once you are happy with the general dimensions, start the detailing

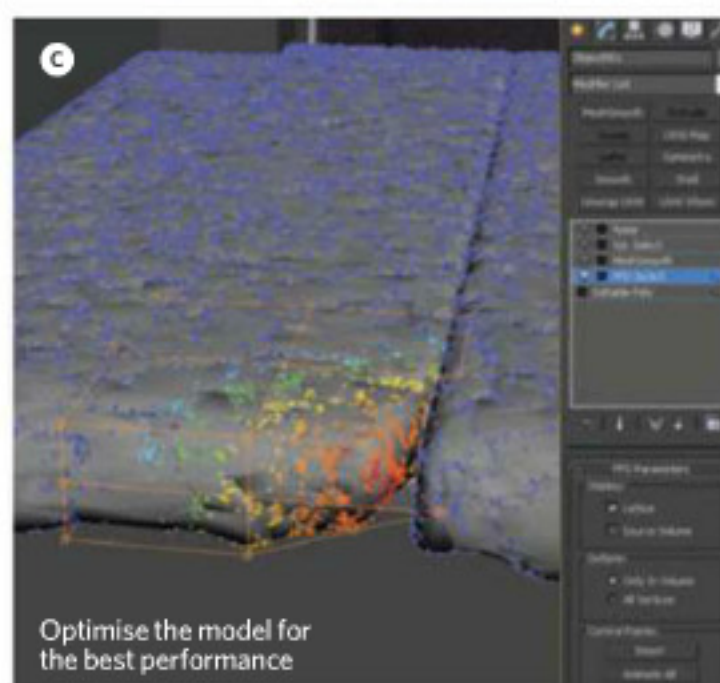


01 Make a basic low-poly shape We need a reference to start the modelling. I started with blueprints I created by photographing a kitchen chair. I also took the measurements to ensure I was working with the correct units in 3ds Max. Start with simple shapes just to get the right dimensions and scale of the chair object. When you are happy with the results you can add maps. In this case, the box-type UVW will do a good job **A**.



Create details in geometry using the Texture and Displace modifier

02 Use textures for geometry creation Once the basic shape is built, we want to give a burnt wooden structure to the chair model. To do this, make the mesh more dense using the Mesh Smooth modifier. Try to work with modifiers so you can go back to a previous stage easily if needed. Create a Displacement map using some appropriate bitmaps from CGTextures.com. Create a simple shader just to see how the map will look on the model. To alter the scale of the texture, adjust the UVW map. Keep this modifier on top of the stack. In the next step apply the Displace modifier and drag the map into the Texture channel. I have used a 1mm strength for my displacement effect **B**.

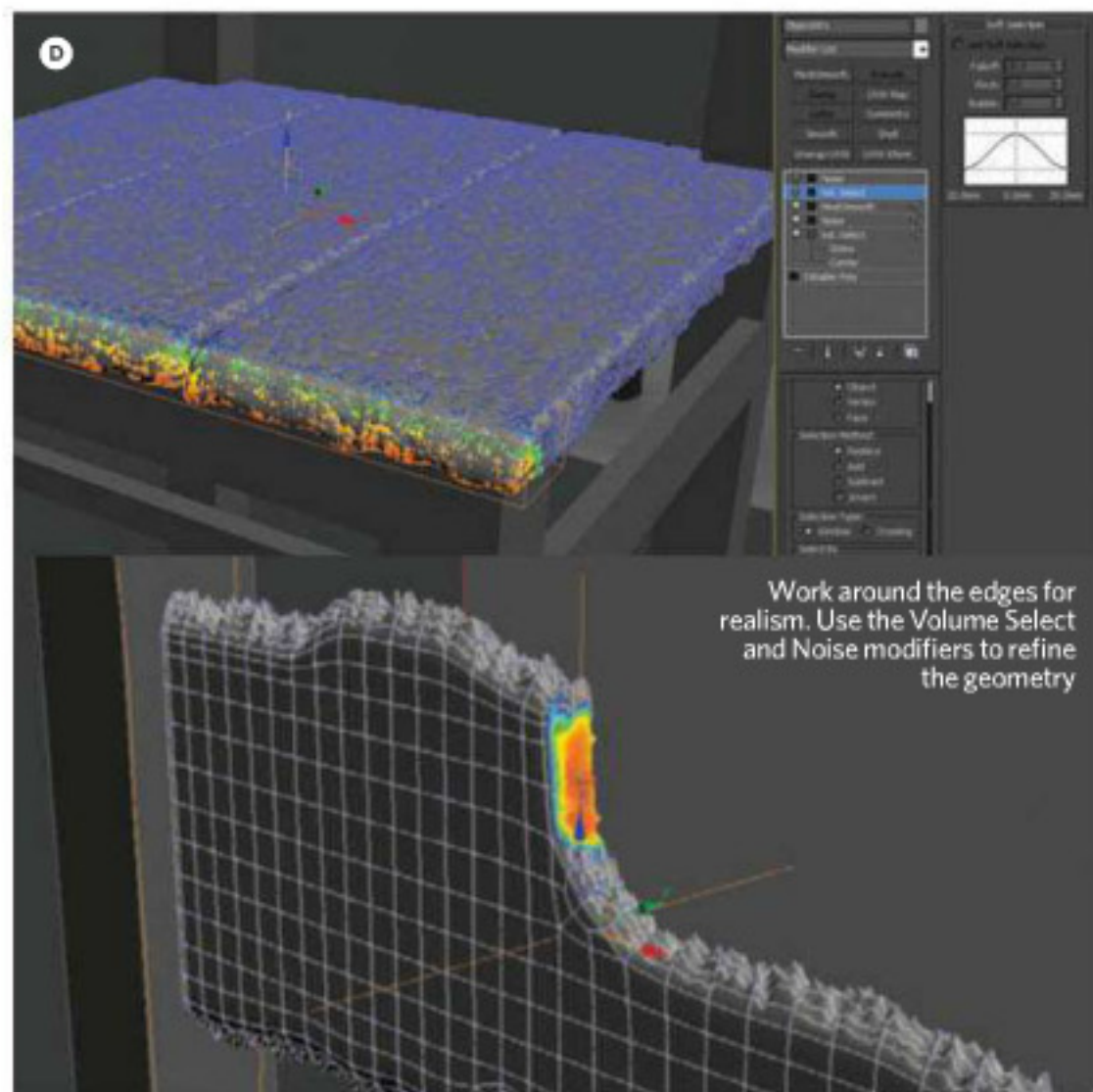


Optimise the model for the best performance

03 Optimise the geometry Since we have added a lot of details with the Displace modifier on a really dense mesh, the poly count will be high. We need to keep in mind that this is an element we may want to use in more complex architectural scenes, so poly count and memory management is very important. To optimise the model, use the Pro Optimizer modifier. Click on the Calculate button and spin down the Vertex amount to around 25%. Once the geometry is optimised you can convert the object back to an editable poly. At this stage you can randomly deform parts of the seat element for a more realistic look. The FFD modifier may be very helpful for this **C**.

Build on your details

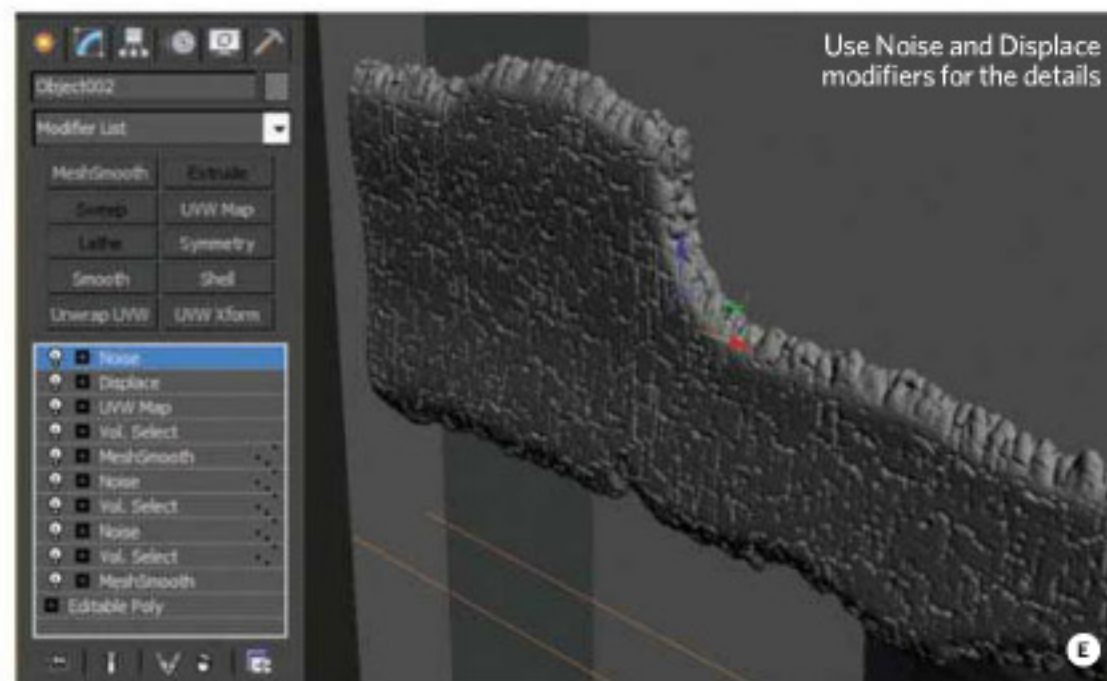
Enhance those edges to add finer detail to the chair model



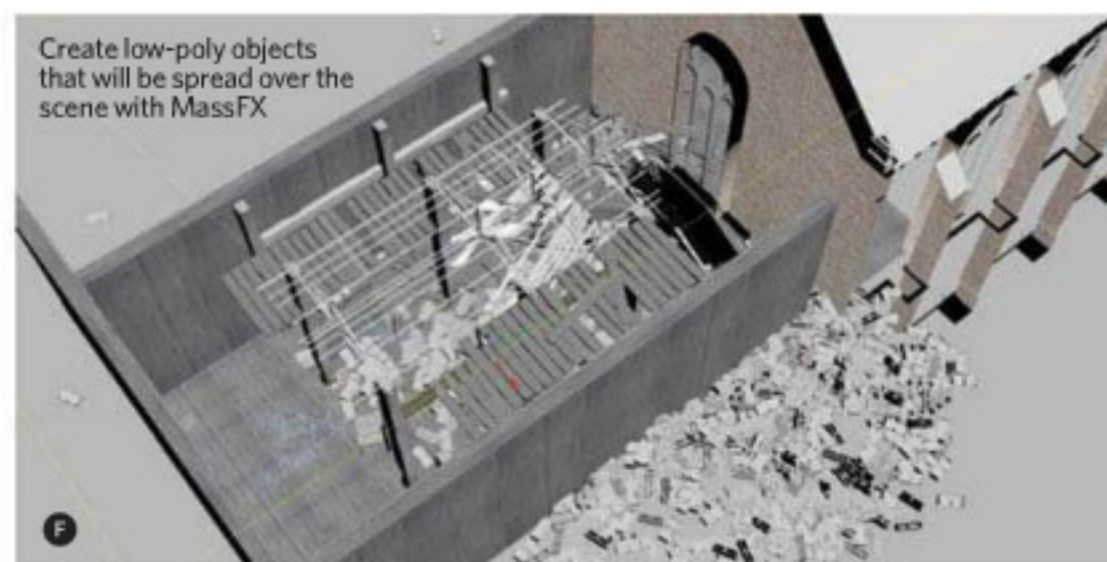
04 Enhance the edge detail This time we need to modify some parts of optimised geometry to enhance details in the most exposed places, namely the chair's edges. These are also the places where most models have issues so it's very important to bear this in mind as you continue. We need to use the Volume Select modifier, which will let us focus on the outer area of the chair elements. Use the Noise modifier to create a strong level of distortion **D**.

Start low and keep it low

While creating a model for architectural scenes we need to remember that it's just one of many elements we will have in the scene. This means we can't create a huge amount of geometry, as it can slow down the rendering and also stress the available memory, not to mention the GPU. Always start with low-poly meshes and after adding detail try to optimise the model and win some polygons to save time and memory. At the end you can always try to replace some geometry details with textures if needed. Play around with Normal, Bump and Displacement maps for realistic results.



05 Tweak the geometry details Convert the model into an editable poly. Again we will have a very heavy geometry. At this point this is fine, because we will use the Displace modifier again with the same texture as the other elements to generate the crack effect over the whole element. Be careful with the mapping and check if the displacement texture looks correct on the object. Last, use the Optimize modifier to save polygons and memory **E**.



06 Create an environment The main model of interest has now been finished, so it's time to create a proper environment. I want the chair to remain the focal point, so all other elements will have less detail. On the other hand, I want to prepare a sort of demolition scene, where a lot of elements and details are crucial. I decide to use MassFX and three types of models to quickly build the impression of a complex scene. Start by modelling beams, planks and bricks as low-poly objects. Those that will land in foreground will require extra detail, just to suit the chosen shot after the modelling process **F**.

Artist Showcase

Paweł Podwojewski

An architect by profession, Paweł is influential in the architectural development of designs and concepts for various industries, such as retail, residential and commercial properties and urban planning.

In 2009 Paweł started CGWorkshop.org, an online service providing training videos and resources for CG artists.



Resort concept 3ds Max, V-Ray, Photoshop (2012)

This concept was designed by Paweł for an island in the Maldives. The scene was kept very low-poly – the best results came from his well-prepared textures!



Restaurant - resort 3ds Max, V-Ray, Photoshop (2012)

A restaurant concept presented in 2012 as part of a resort complex. The roof is the key element, as the rest of the structure is made from simple straight lines

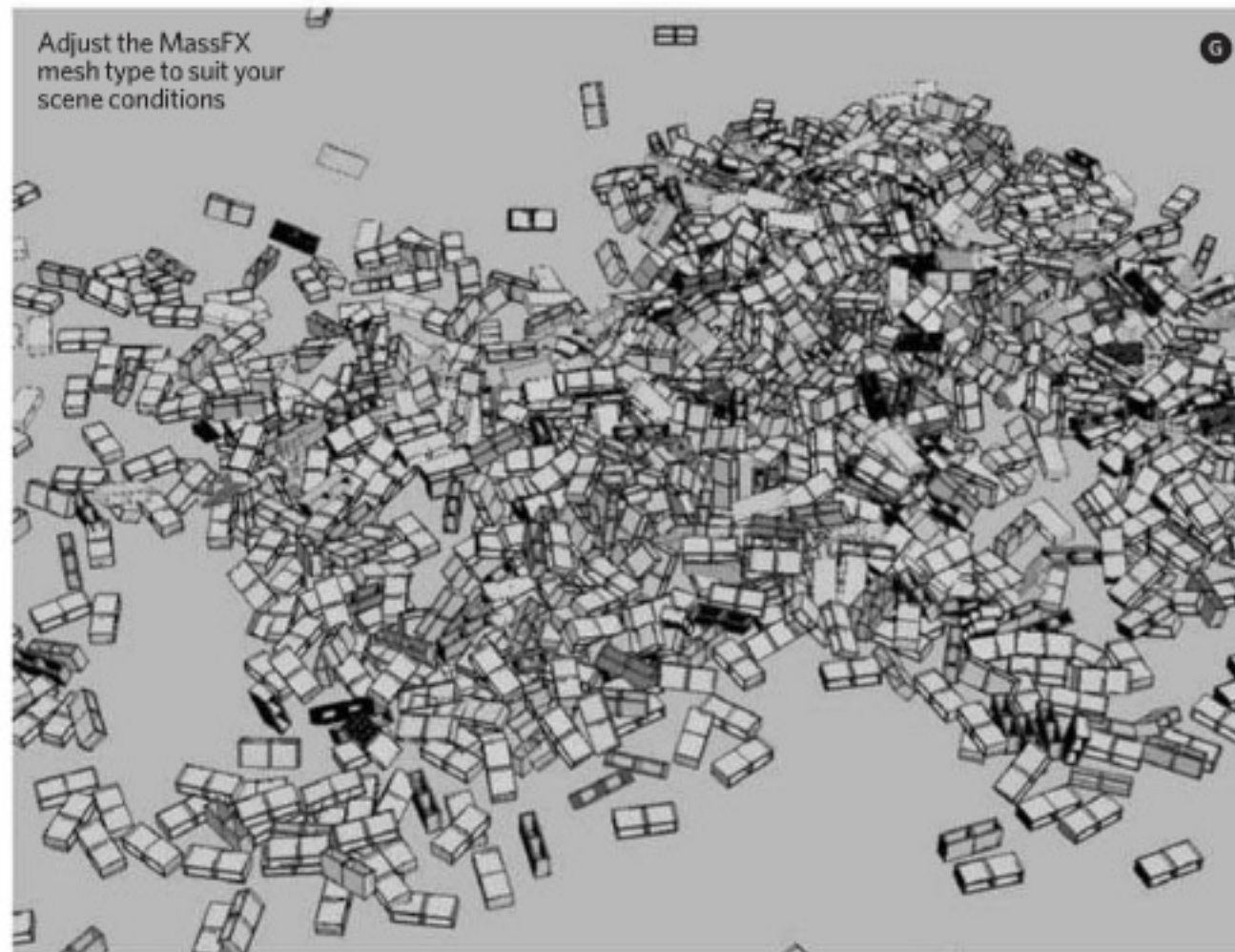


Model some chaos

We'll now explore MassFX to begin the demolition...

07 MassFX demolition

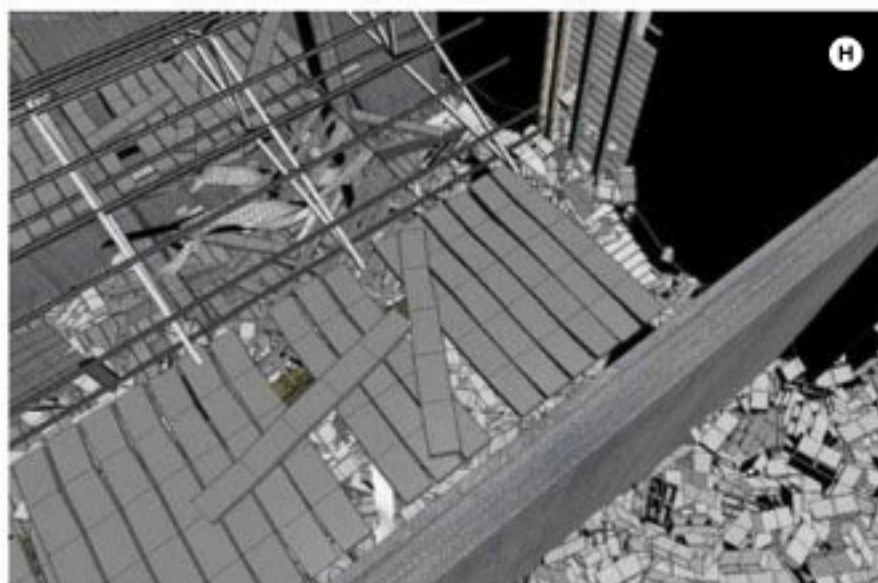
Once you have the bricks, planks and other elements ready, select the objects, go to Animation then choose Simulation - MassFX>Rigid Bodies>Set Selected as Dynamic Rigid Body. Open the Modify panel and change the Mesh Type from Default Convex to Original. This will make the calculations longer but the objects will collide very precisely (you can use Convex with simple shapes such as boxes). Create multiple instances of these objects and place them somewhere in space. Last, run the simulation, choosing Animation>Simulation - MassFX>Utilities>Show MassFX Tools. From the Tools tab click on the Play button and when you're happy with the result, pause and hit Bake All. This keeps your objects and animation keyframes in the scene **G**.



Demolition methods

In our scene we have are using MassFX to spread and collide elements. But we can also work with Particle Flow systems to get more control over the final effect. The creation of debris, rain splatter and fog can be really easy! To get started with particles I highly recommend you study a very helpful preset pack created by Allan McKay (visit www.allanmckay.com).

- H** Copy the created MassFX group to the background
- I** Detail foreground environment elements after setting the final camera position



08 Multiply objects for the background Once the MassFX simulation is done we can select the objects and copy them by holding down Shift and dragging them into another place. We can repeat this action a couple of times to create a background scenario. Since they will be pretty far away, we don't need to be concerned if any of them intersect **H**.



On the beach 3ds Max, V-Ray, Photoshop (2012)

A beach view of a restaurant. The key element in the scene was the sand; to create a realistic effect, a V-Ray Displacement modifier with a Noise Procedural map was used

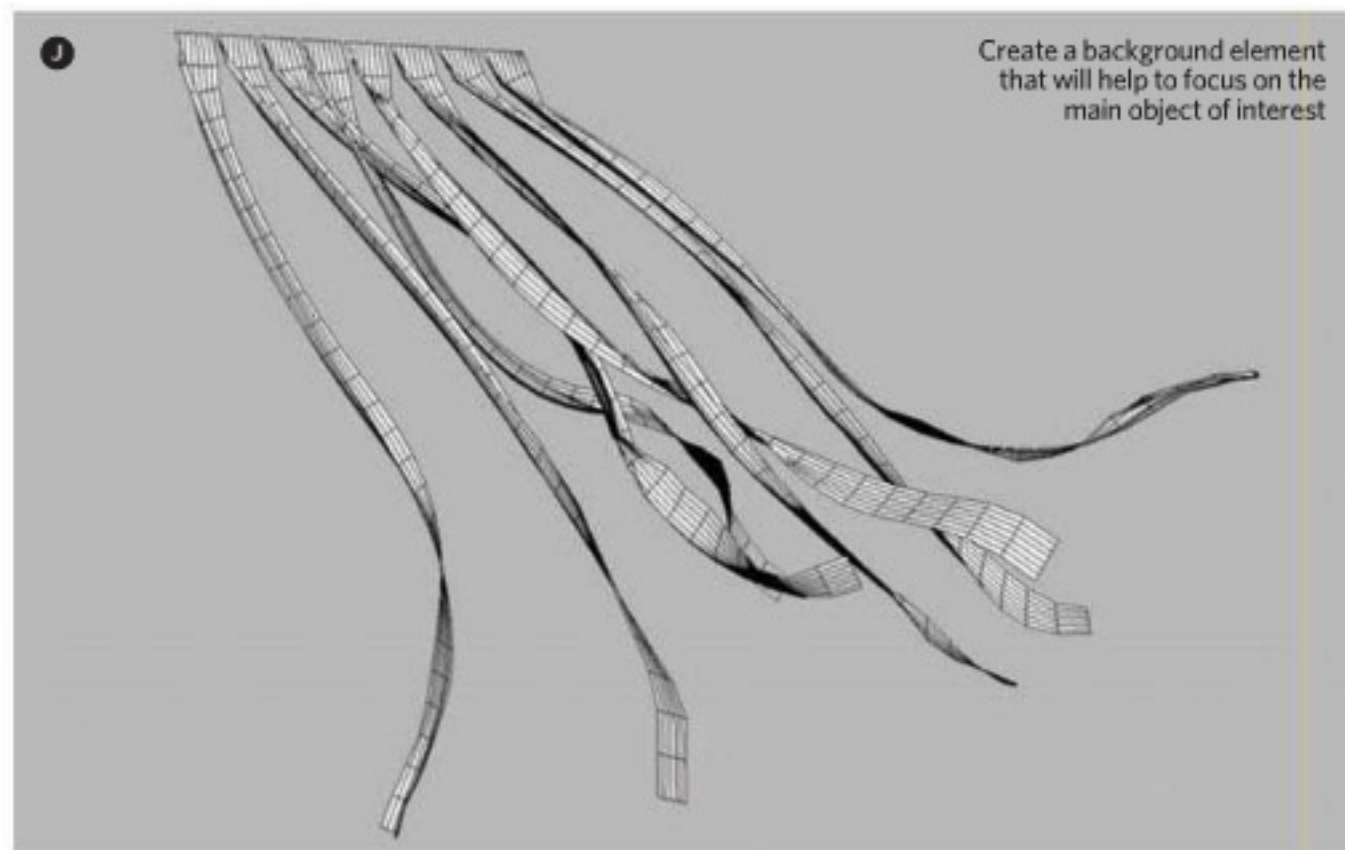


09 Set the camera for the final composition It's time to set the final camera position. We are working with a standard camera, which is fine. You can apply the Camera Correction modifier to control the vertical shift if needed. Choose some of the bricks in the foreground, convert them into editable polys and play around with the edges to make them a little more detailed. I'm using a Chamfer and, with Soft Selection enabled, move a couple of vertices to achieve an irregular look **I**.



Lighting and shading

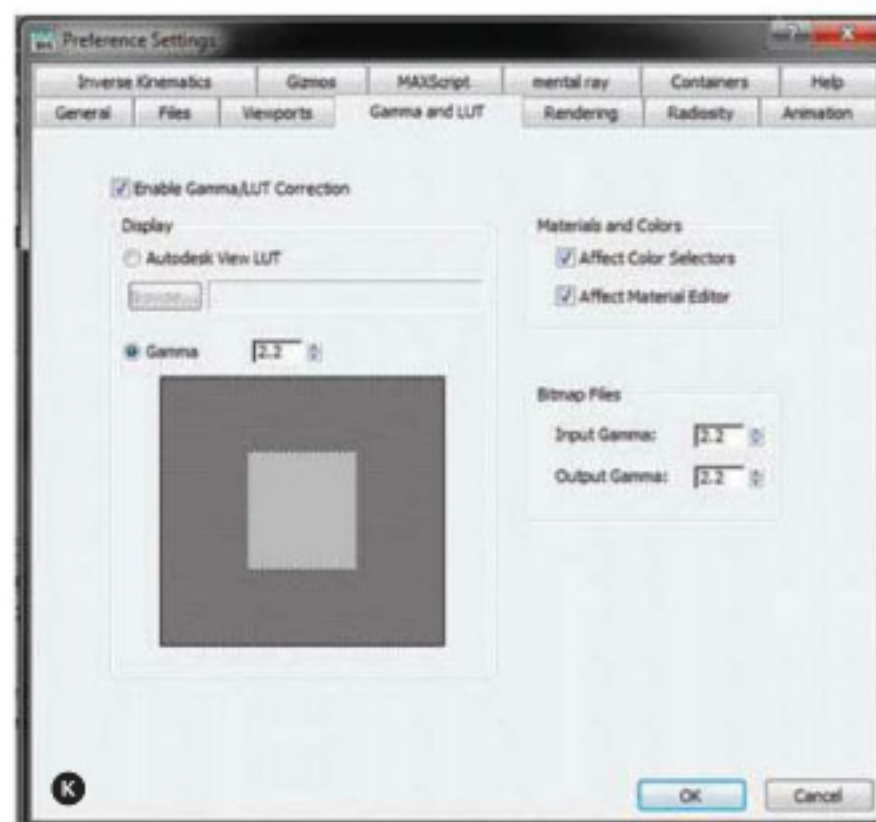
Use mental ray to unify your scene



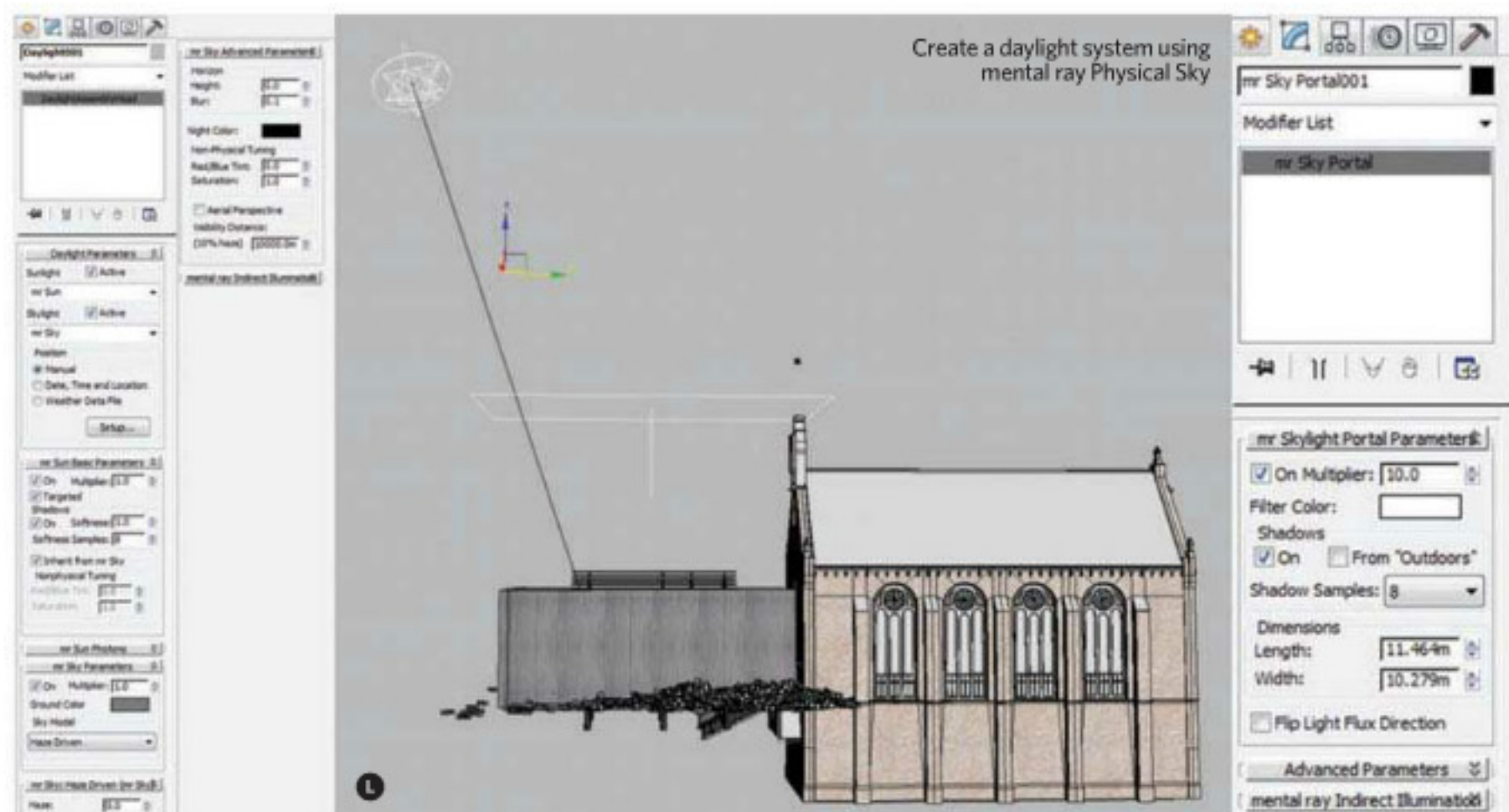
10 Add a cloth background element The chair object is our main object of interest, but there is a lot going on in the scene and the black chair on a dark background makes it disappear. To avoid this, I add one last detail to the scene. Create a couple of stripes using a Plane object, convert them into an editable poly and attach them to one element. Create a force object: Wind. Apply the Cloth modifier to the stripe object, and from the Object Properties tab check Active Cloth and select your favourite preset (cotton, in my case). Add the wind to the cloth forces. Select the top vertices to create a group. Use a Node and choose a beam scene object to stick the cloth to. Run the simulation and play with the wind strength. Stop at the desired moment and convert to an editable poly. Apply the Mesh Smooth modifier to refine the geometry. You can collide the cloth with other scene elements if you wish, adding the objects to the cloth list and setting them as collision objects. To make the cloth more interesting, add an Opacity map to the cloth shader to achieve a worn look **J**.

Physical camera advantages

The standard 3ds Max camera has a bunch of simple options like FOV and lens presets. These options are good enough to set the desired view but will not let you control the light in a physically correct way. mental ray exposure control can resolve this matter, providing a very accurate tool that can enhance not only lighting management but also depth-of-field effects, plus more flexibility with the image contrast levels (highlights, midtones and shadows).

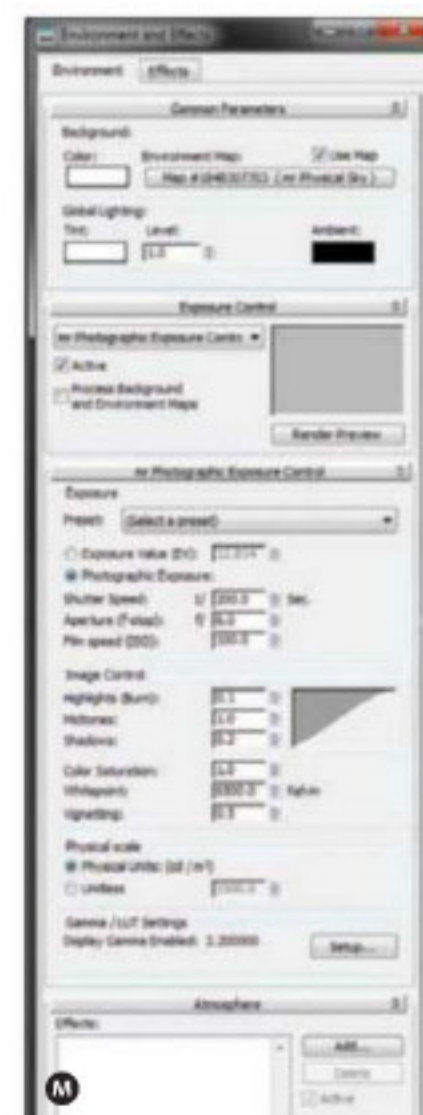


11 Set up the lighting system First let's take a look at the Gamma and LUT settings. As you can see, the Gamma has been set to 2.2 and so has the Input and Output for the textures. Also the Color Selector and Material Editor will be affected by checking them under Materials and Colors. This means we will work in a linear space that is physically correct **K**.



12 Adjust the lighting Now we'll create a lighting system based on direct light: Daylight System (Create>Lights>Day Light System) and mental ray (mr) Physical Sky, which will be added automatically to the environment and act as ambient light. Tweak the settings of the mr Sun manually or use a time of day. A second light source will be located above the scene as a plane light source - mr Sky Portal. This system will support the scene with the proper amount of samples to perform good-quality calculations **L**.

13 Adjust the camera exposure The standard camera is a very simple, if limited, tool and works fine for setting up the initial angle. Using a daylight system, mental ray will automatically add an Exposure Control to our cameras: mr Photographic Exposure Control. This action will enable you to work on the exposer using a standard camera, like a physical one, with all the options like shutter speed or film speed ISO. This will let you control the light intensity on your rendered image much faster, without changing the lighting system. You can enable DOF in the camera under Multi-Pass Effect **M**.



K Try to work within a linear workflow to save time at the rendering stage

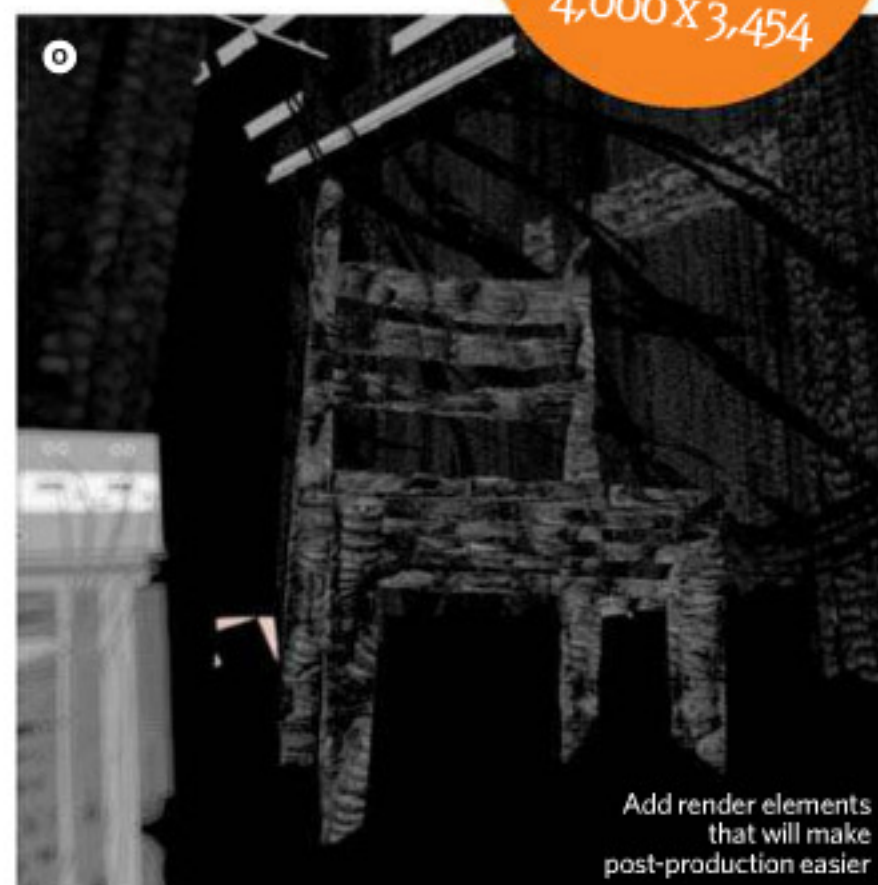
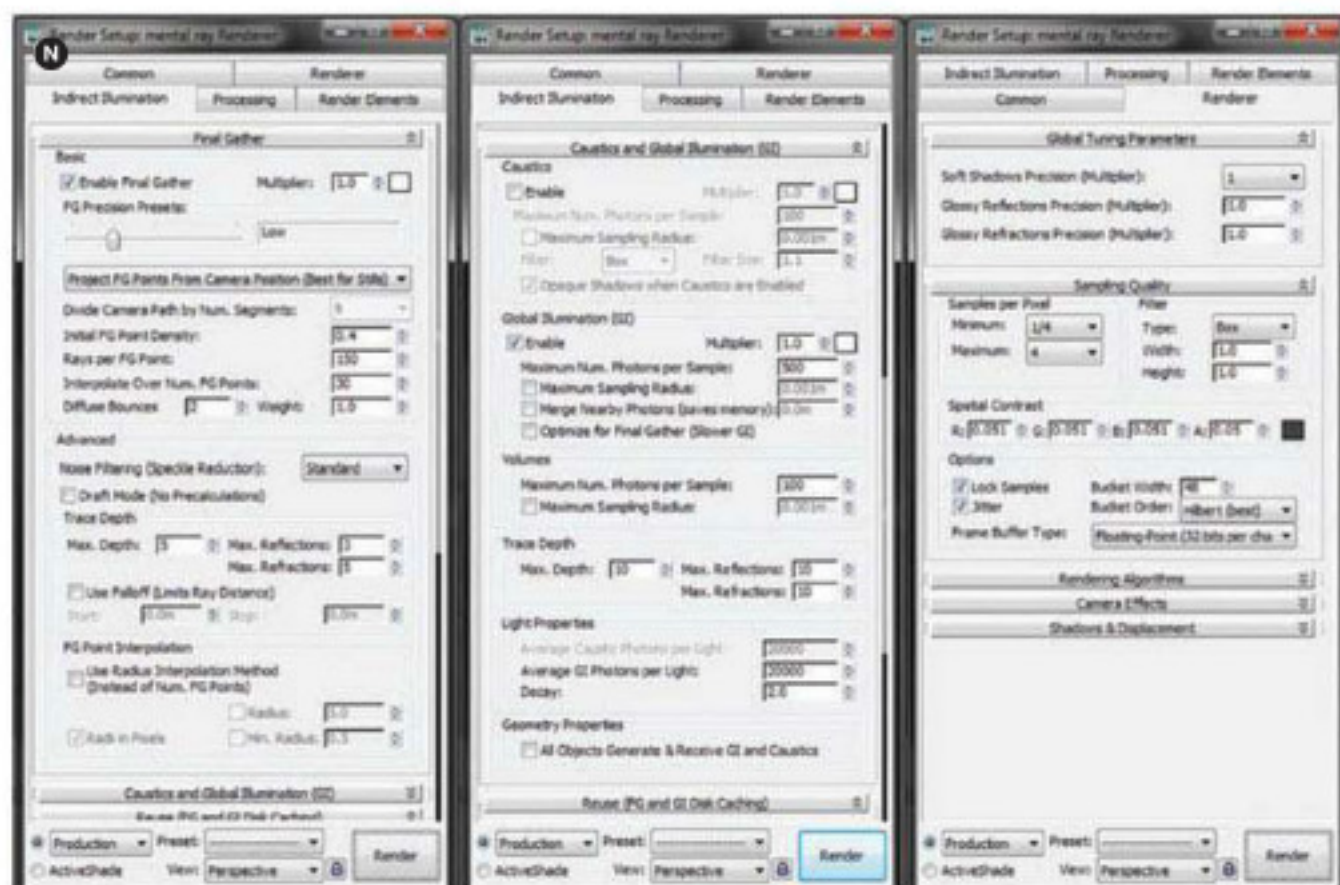
M Use mr Photographic Exposure Control for simple physical camera adjustments



Rendering and post-production

Use mental ray and Photoshop for your final tweaks

4 hours
creation time
Resolution:
4,000 X 3,454



Add render elements that will make post-production easier

14 Set up the scene render Keep the mental ray settings at default. Enable Final Gather (FG) and Global Illumination (GI) in the Indirect Illumination tab. Tweak the Sampling Quality depending on your resolution. In my case, with 4,000 X 3,454 pixels the minimum Sample rate per-pixel has been set to 1/4 and the maximum to 4. Remember that higher resolution and higher FG settings will consume more RAM. You may want to cache the FG in lower resolution and load it while rendering the final output to save memory and keep a decent quality **N**.

15 Choose render elements Before starting calculations, think which render elements will be used in post-production. For DOF generation we will need the Z-Depth channel (you can render DOF using the Multi-Pass Effect option in the camera, which increases render time), and an Alpha channel for sky replacement. We may also want to enhance some reflections with mr A&D Raw Reflections. Once we have selected all the elements we can start rendering **O**.



Perform basic colour-correction and contrast adjustments on different layers and control them with masks

16 Begin post work with Photoshop The raw rendering is a bit pale and lacking contrast. The background elements are also too distracting. Contrast correction with curves and colour tweaking with Color Balance will be the first steps to improve the general impression. Also use a Shadows/Highlights image adjustment – apply it to a copy of the main layer and place it above all others with the Overlay blending mode. This will increase the contrast effectively. Use a mask to make the effect visible in places where it's suitable **P**.

17 Atmosphere and render elements

Create two channels. Use Calculations to generate an Alpha and Z-Depth channel. Using a Lens Blur filter with the Z-Depth we can control the depth-of-field effect and blur the background a little to focus the viewer on the chair. Use the Alpha channel as a selection to replace the sky. To finish, we can add some distortions – again using the Lens Blur filter, like chromatic aberration and vignetting. Try to paint atmospheric effects like glows and smoke trails using Photoshop brushes. The Z-Depth channel can also help you create a mask to control the intensity of the image and make it pop! **Q**

Post work that saves you time

Renders with depth-of-field effects can be rather attractive. Still, the physical calculations may take a while and very often there simply isn't enough time to be spent on them. You can speed this process up with acceptable results using extra plug-ins like Bokeh 2 by Alien Skin Software or frischluft for After Effects, which works really well in animations. For motion blur effects we can use Velocity channels – this is another solution that can help fake the physical calculation process.



N While adjusting mental ray, remember higher settings will increase the RAM usage

O Control the viewer's focus with DOF

I made this...

Incredible 3D artists take us behind their artwork

Artist info



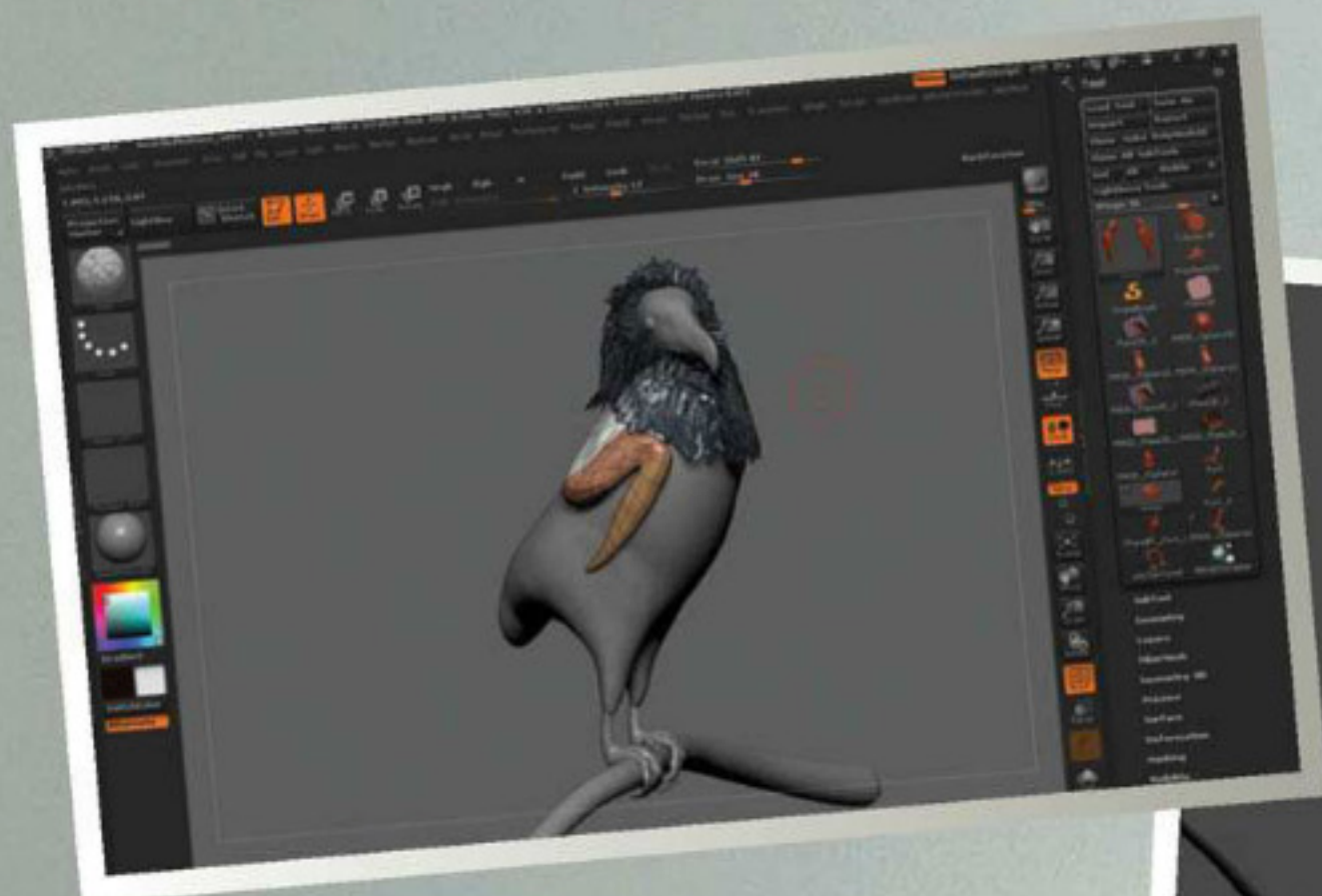
Daniel Bystedt

Website <http://dbystedt.wordpress.com>

Country Sweden

Software used ZBrush 4R3

Bio Daniel studied CG and digital graphics, at Nackademin in Stockholm, Sweden



“ Use your feather texture on a plane3D (converted to a PolyMesh 3D), then use the Move and Smooth brushes to straighten the feathers. Use the MRGBZGrabber from the Tool menu and [attach] the straightened feathers to individual textures. You need to use a black background for the feather texture as ZBrush only uses black as transparent in textures. These textures can be applied to all FiberMesh SubTools ”

Software used
in this piece

ZBrush
4R3

Bearded Vulture 2012

After making some fur and hair with ZBrush's new FiberMesh feature, I wanted to see if it could handle feathers in a good way. Initially I was thinking about designing some kind of bird creature myself, but in the end I simply created a photorealistic model of a bearded vulture, since I liked the look of that particular bird.

“ Bring a reference of the bird you want to model into your favourite painting software. Then do an overlay of colour blocking that shows the different feather-type areas of the bird. This will help you tremendously when creating the feathers in 3D ”

“ When you paint FiberMesh, you paint by vertex unless there is a texture applied. This will make the feathers look like they are painted with an airbrush and that they don't have a natural colour per feather. Use the mask pen brush to mask off entire FiberMesh strands at once, invert the mask and then paint to get a more natural look ”



“ Front collision tolerance samples the volume of the underlying surface and groom so that the FiberMesh will not intersect with the underlying geometry. The option determines how close the FiberMesh will be groomed to the underlying surface and can be found in the menu Brush>FiberMesh ”

The studio • Concept in ZBrush

Software used
in this piece

ZBrush

Photoshop

Using a custom brush in Photoshop, I added red projections coming through from inside the visor

To create the unique material of the chestplate, I added an image of fishnet stockings as a texture to the material

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info



Jerad S Marantz

Personal portfolio site
<http://jeradsmarantz.blogspot.com>

Country USA

Software used
ZBrush, Photoshop

Expertise Jerad specialises in creature design, but his talents have also been used in key frames and vehicle design

Film credits Rise of the Planet of the Apes, Clash of the Titans (lead character designer), Sucker Punch (lead character designer), Transformers: Dark of the Moon, Green Lantern, Avatar, Snow White and the Huntsman, GI Joe: Retaliation, The Amazing Spider-Man and Riddick 3

I love adding little touches that give depth to the character, like the serial number on his chest

Concept in ZBrush

The Dark Rider 2012

“Take your modelling abilities to the next level with this quick guide, from building the concept in ZBrush to finalising in Photoshop”

Jerad S Marantz is a creature, character and concept artist

The *Dark Rider* character is something I've had floating around my head for a couple of years. Being known as a creature designer I don't often have the opportunity to do a lot of technical designs, so I took some time out to create a portrait to develop my own hard-surface techniques in ZBrush.

As a designer I rarely worry about the geometry of a model. My job is to create the image and 3D is simply a tool I use to make my designs more real. In my experience in entertainment design, the one constant is that the client wants the design in less time and as realistic as possible. I compensate for the looseness of models by painting over them in Photoshop. This technique is a lot faster than creating a clean model every time you make a concept.

Concept

I write a lot in my spare time and it inspires my work. I love writing science fiction and this character is one of my favourite antiheroes from my independent works. When I get writer's block I find it helps me to illustrate my characters and bring them a little closer to life.



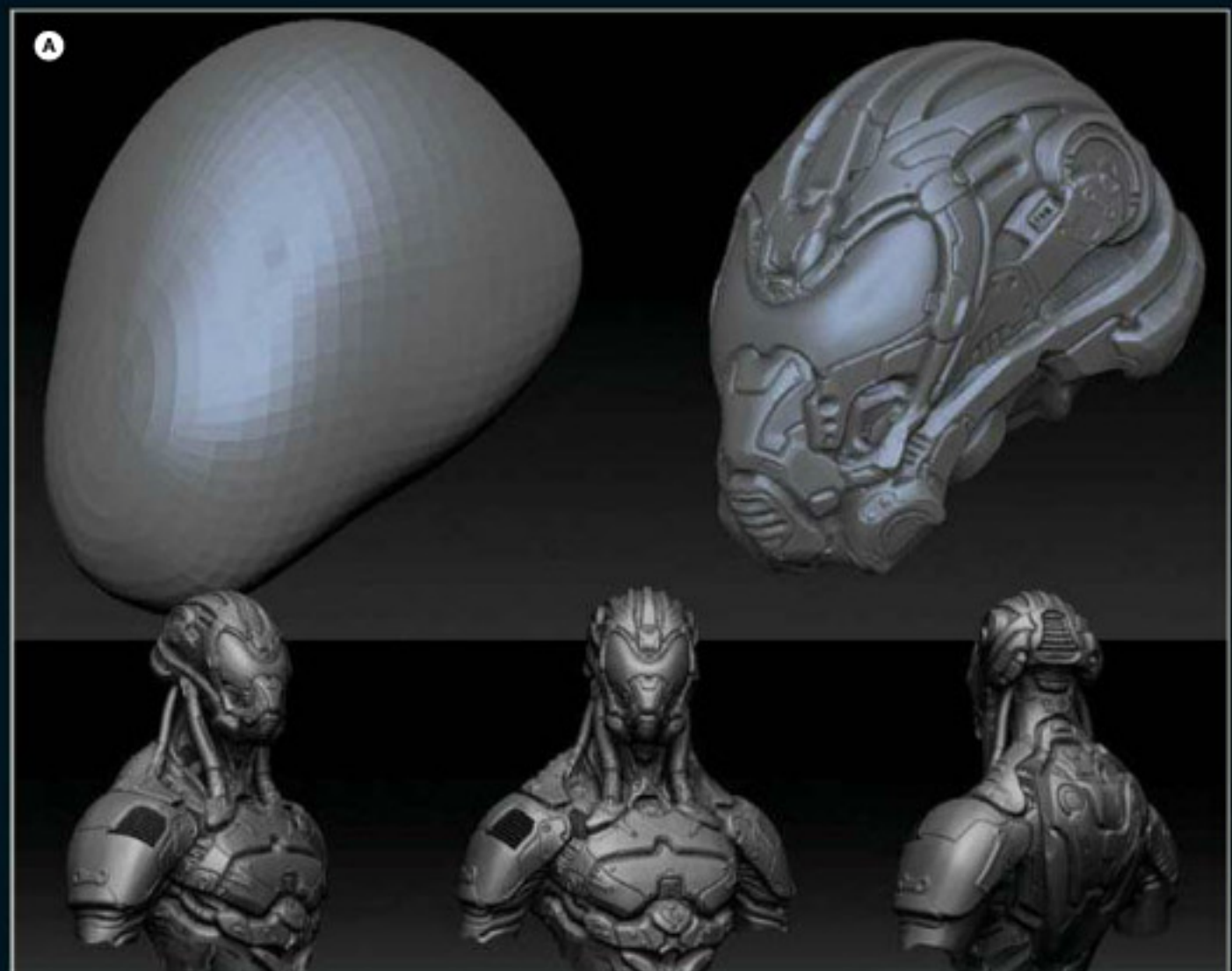
Model the character

Begin shaping the elements of your figure in ZBrush

01 Sculpt the character I start in ZBrush with a simple PolySphere to focus on designing the helmet. Designing the helmet as a separate ZTool enables me to get the maximum amount of geometry. You can easily get a SubTool up to 15 million polygons without it slowing down a decent computer!

Using the Move Topological brush with the PolySphere at its lowest subdivision, I push and pull the geometry into the shape of the helmet. Then I bring the ZTool to subdivision level six. I find that when working on a hard-surface model it's best to sculpt at high resolution. This way you have a lot of geometry to work with and the SubTool can accommodate clean edges.

To cleanly isolate certain planes I mask them out and then invert the selection so that I can go to the Deformation palette and inflate the unmasked section to create a plate. You can also do this by going to Transform>Move. After my main forms are established I then use the MAHcut brushes, Dam Standard, Hard Polish and Trim Dynamic to detail the model. The biggest mistake I see people making when trying to replicate hard surfaces in ZBrush is using the brushes to polish and refine the shapes. You can get so many complex forms by simply masking them out **A**.





Develop your robot

Add details, render and improve in post

How to create alphas in Photoshop

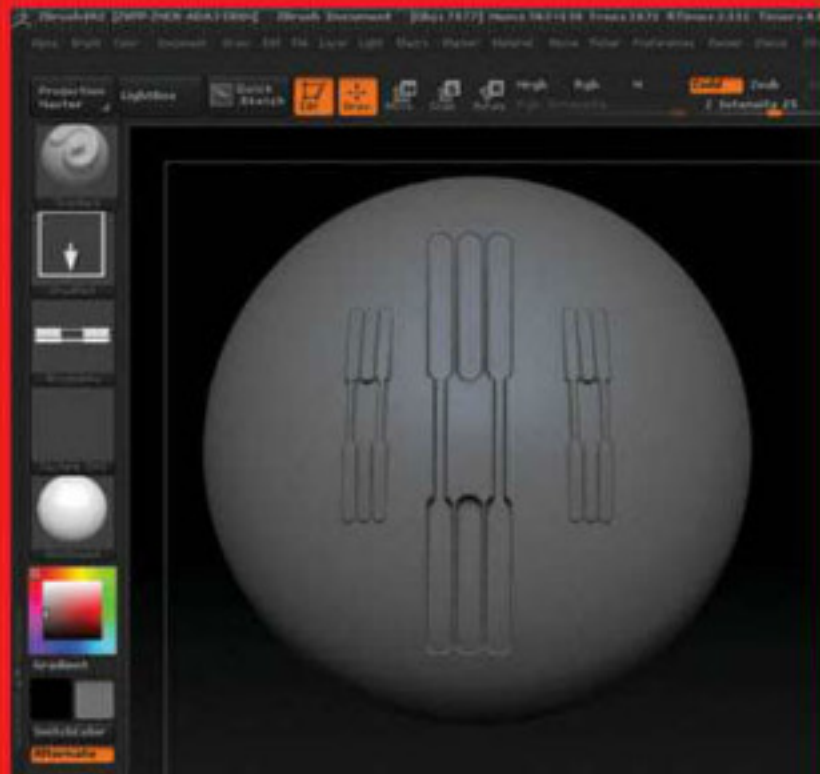
Alphas are really easy to create in Photoshop. In the program I open a new document that is 5 x 5 inches in diameter and at 200 dpi. Create your pattern in black and white. Remember, everything that's white in an alpha will lift up when applied to a ZTool. Save the image out as a JPEG and import it into ZBrush through the Alpha palette.



Open a new document in Photoshop at 5 x 5 inches and 200 dpi to create a black-and-white pattern that will form the basis of your alpha

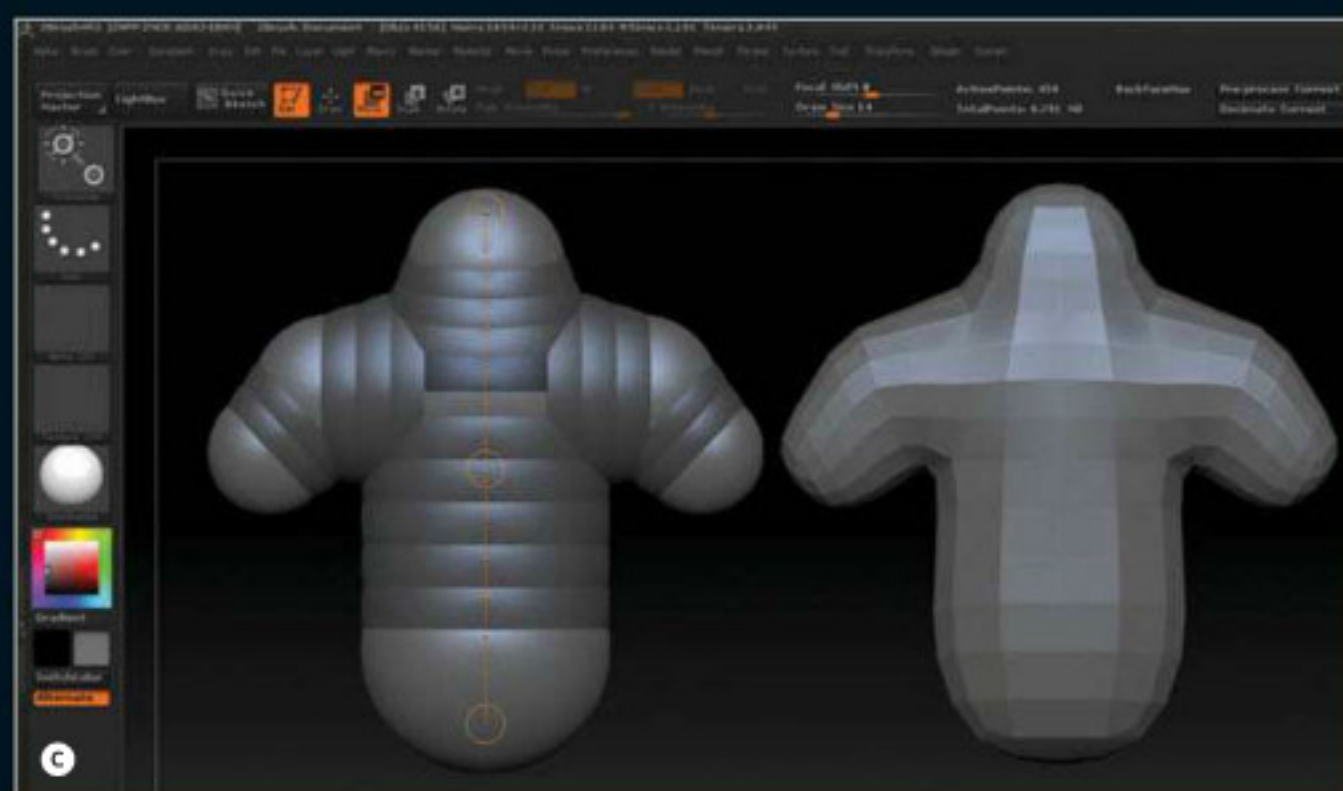
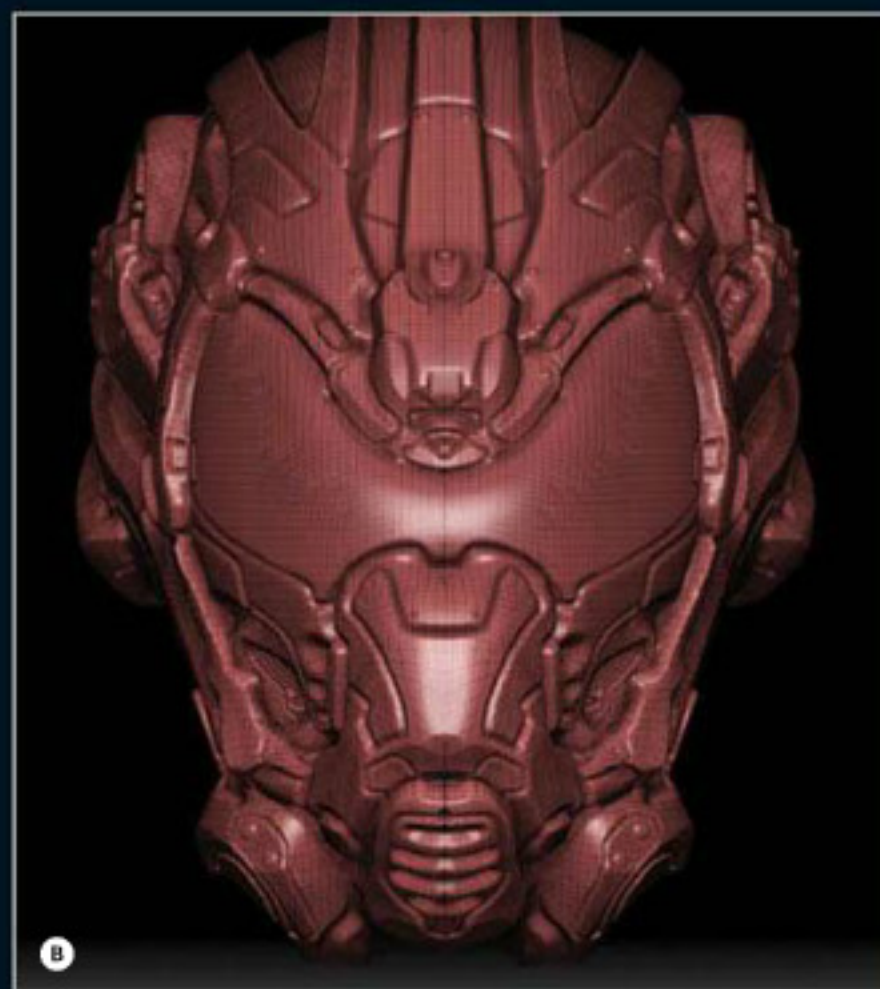


Keep in mind when creating your patterns in Photoshop that everything you make white in your image will raise up when it's applied to a ZTool in ZBrush



Once you've saved your images out as JPG files and imported them into ZBrush through the Alpha palette, you can use them to add unique shapes to your ZTools

02 Re-mesh the helmet When I get to a point on the helmet where I'm running out of geometry in areas that I want to continue to detail, I re-mesh the SubTool and project the new mesh over my old helmet sculpt to create a copy of the helmet with cleaner geometry. Projecting can be effective, but you will lose depth in your sculpt. I simply use the Dam Standard brush to carve it back in **B**.



03 Sculpt the upper torso I append ZSpheres and create an Adaptive Skin. At a high subdivision I mask off the pectoral plates and abdominal pieces. Using the Move tool I pull the unmasked sections forward to create a clean plate. I do the same with the shoulders. I paint using the Masking brush and create some odd details like brackets and bolts. I invert the selection and inflate them so that they appear to be sitting on the plane above the major plates. To create the vents on the shoulders I mask off the section for the vents and, using an alpha created in Photoshop, drag it across the surface of the sculpt while pressing the Opt/Alt key. This pushes the alpha into the model. The alpha only affects the areas that are not masked off **C**.

Discover the MAHcut brush

These brushes are incredible for sculpting bevelled edges at high resolution. They're also great for detailing hard surfaces in ZBrush. The brushes were created by ZBrushCentral forum member Mahlikus The Black, who is (very generously) sharing the brushes for free on the forums. Visit <http://tinypurl.com/ZBrushMAHcut>.

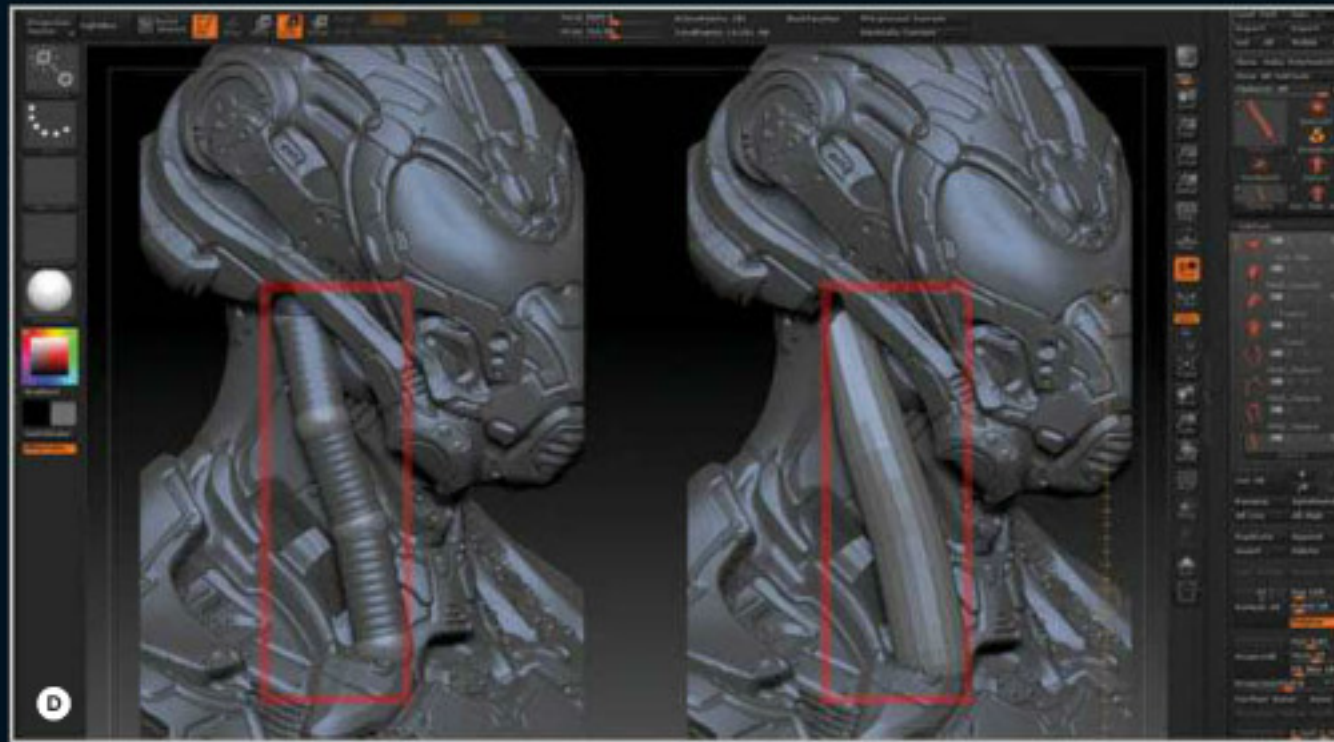


04 Create the neck pipes

The hoses on the neck are appended ZSpheres that I create an Adaptive Skin from. Using the Masking brush I inflate and deflate sections of the ZTool to create different sections within the tubes **D**.

05 Materials and rendering

After saving out the SubTools as OBJs, I import them into my rendering program. I make sure that my lighting is dramatic and I render out my model in different materials like metals, rubber and acrylic. Rather than rendering multiple OBJs I merge my model into one OBJ so I can render the materials all at once. This way I have more options when I bring the material passes into Photoshop **E**.



ZBrush sculpting tips

There are a few mistakes I always see beginner modellers make. Here are a few tips to overcome them:

- Always try to get the most out of your lower subdivisions. When working with less geometry you're able to manipulate the forms more cleanly. Subdivision level two is a great place to begin building up your character's anatomy
- Try to limit the number of brushes that you use to create your model. As you refine your process you may discover that you only need two to four brushes to sculpt your piece
- As you're sculpting your model, constantly move it around and make sure it looks good from all angles. This is usually many artists' first mistake
- Most importantly, always challenge yourself and always be patient. Mastering this takes time!



06 Photoshop and finishing touches I bring all of my renders into Photoshop and drag them into one document. This is where the design can really come to life. I go through each material and erase out what I don't need from each layer. After isolating each material I have an illustration that is 90 per cent complete. At this stage I clean up the design with an airbrush by tightening certain areas and adding sharp highlights. I then add colour accents and a background **F**.



Design and model a robot

Red eye 2012

“A robot design created for practise and to demonstrate some helpful hard-surface modelling techniques”

Niles Doubleday is an environment artist at Airtight Games

If you love robots or sci-fi and want to turn some of your ideas into 3D, this tutorial will give you a great start.

We'll begin by going over some of the basic design techniques involved in coming up with balanced thumbnails. Once you've got an idea you're excited about, you'll then be able to turn your idea into a fully-fledged

3D model. We'll go through the basic workflow I use when hard-surface modelling in 3ds Max and then render in KeyShot (look out for my mental ray tips on the opposite page).

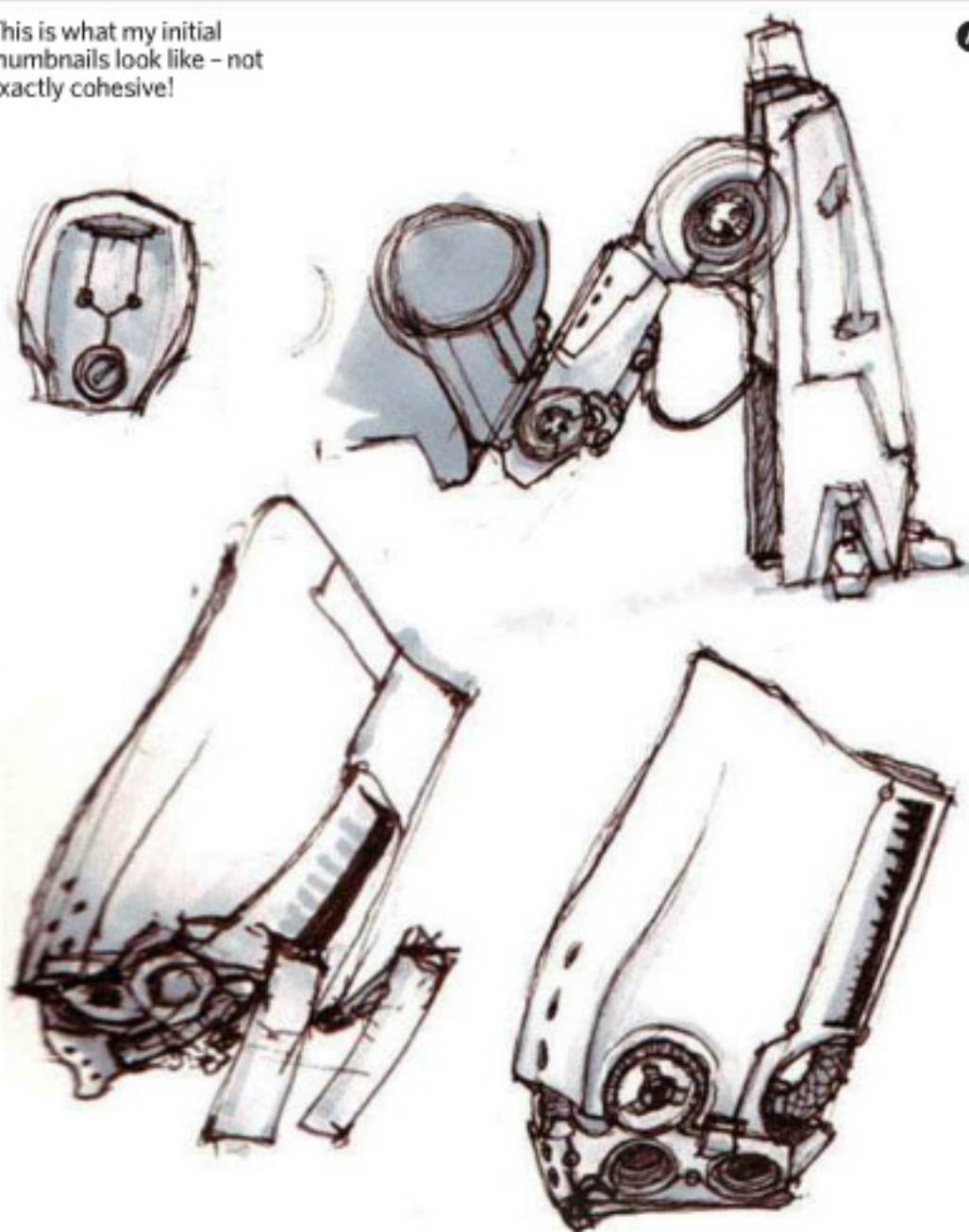
If you're already a modelling pro I've included some hard-surface tricks for 3ds Max, before we finish off with a few quick steps to make your render pop in Photoshop.



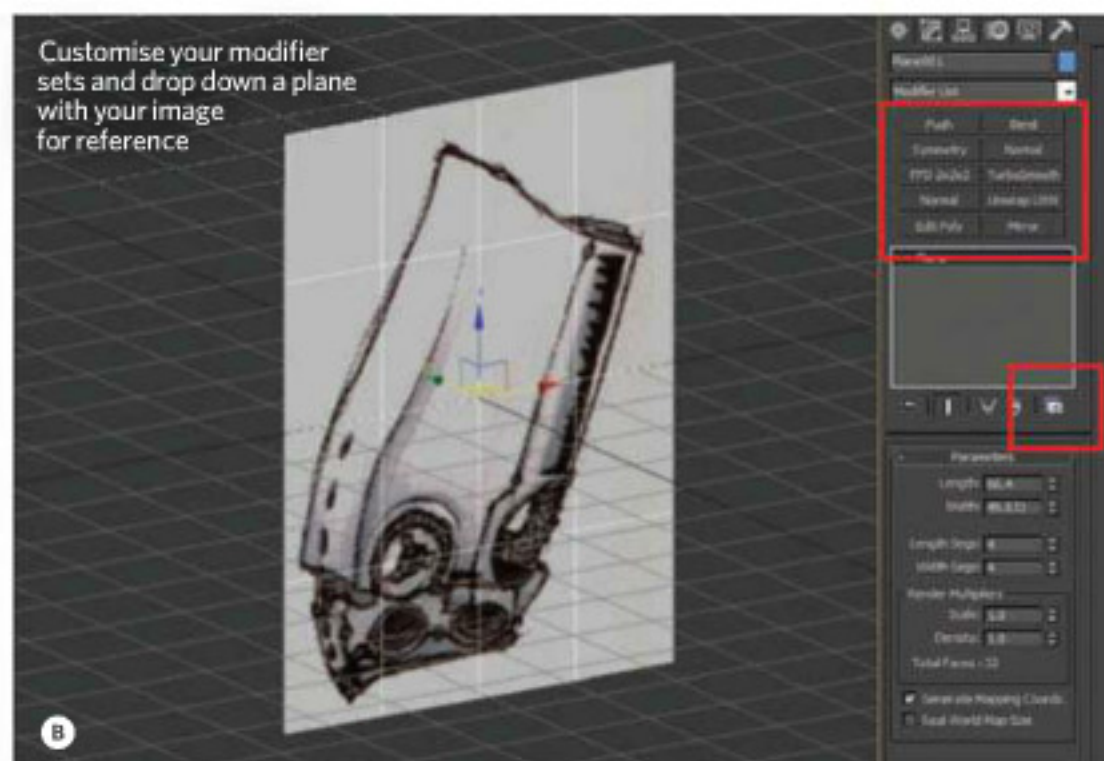
Pre-production

Plan now, save time later – the most important step!

This is what my initial thumbnails look like – not exactly cohesive!



Customise your modifier sets and drop down a plane with your image for reference



01 Develop a concept The key to concept development is to draw all your ideas – even the bad ones – as you never know which direction your design may take. Grab the elements that you like from one sketch and then apply them to another in a different way. Just throw down a bunch of ideas without worrying about polishing them or thinking too hard about it. Details can be as loosely represented as random lines; once you have some general volumes you like, then you can take some time to deconstruct it and detail those parts individually **A**.

02 Set up a scene I usually take one of my key concepts and put it in the scene on a plane aligned to one of the axes. I always use an Orthographic camera, but it's especially important at this stage. The Orthographic view makes it a lot easier to make shapes accurate to your concept when you start modelling. I've also added some common modifiers to my Modifier box on the right. I strongly recommend setting up this UI element to support your most-used functions **B**.

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info



Niles Doubleday

Personal portfolio site
www.nilesd.com

Country USA

Software used 3ds Max,
KeyShot, Photoshop

Expertise Niles enjoys all aspects of 3D, but specialises in props and environments for video games

Learn how to

- ✓ Design robotic elements
- ✓ Use hard-surface modelling tips and tricks
- ✓ Render quickly and easily
- ✓ Enhance your render in post using Photoshop

If you prefer mental ray...

This tutorial was created using Keyshot, however it's possible to easily achieve great results right in 3d studio max using mental ray. Start by using the arch and design materials found in the material editor, choose some of the presets for the materials you need, then adjust the colors to your needs. Then hit F10 to bring up the render settings and switch the preset to photometric, mental ray, next turn on final gather in the indirect lighting tab. Next throw in some basic lighting, use a couple of mr Sky Portals found in the photometric lights, adjust there color and brightness. I use draft setting to get the ballpark settings, then for the final switch over to higher quality.

Software used in this piece

3ds Max

KeyShot

Photoshop



Concept

My initial concept was a heavy, low-to-the-ground robot about two/three-feet tall. I am really playing with the idea of a 20:80 ratio of detail versus overall shape

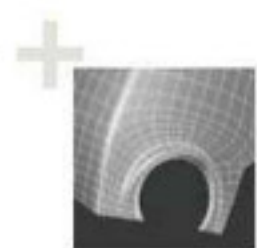


With the Disc

You'll find the final models from this tutorial accompanying the cover disc:

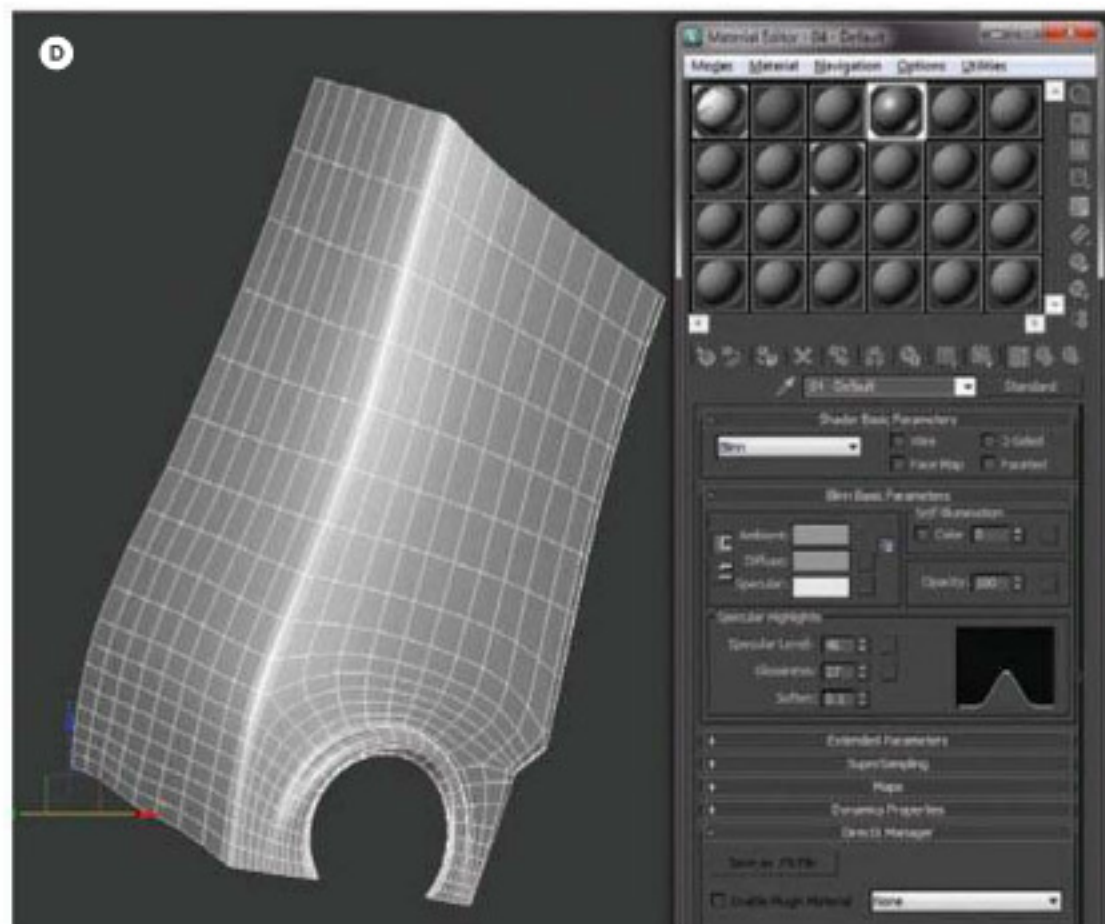
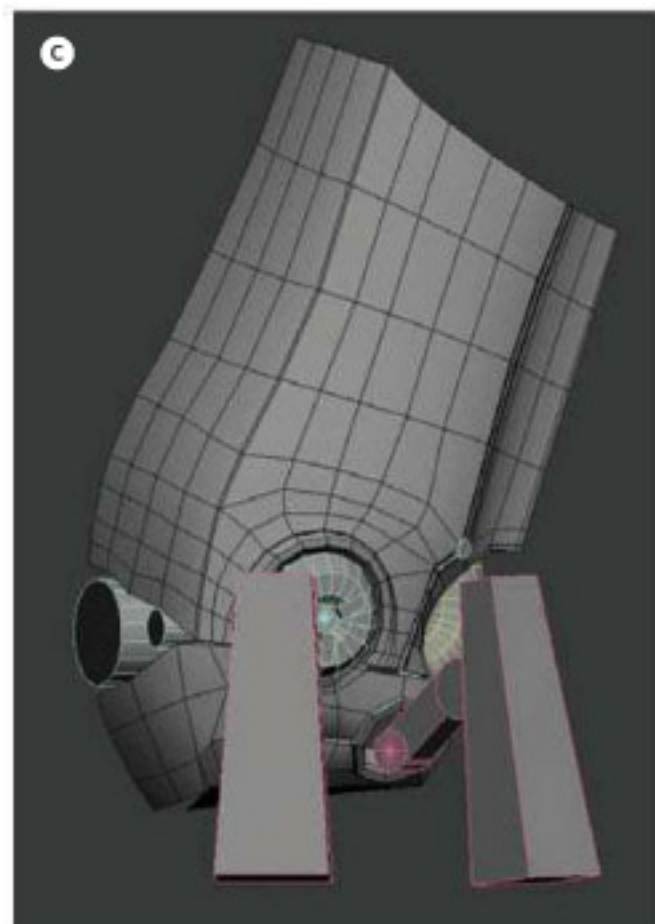
- Final_Model_01.max (2011)
- Final_Obj.obj





Begin modelling

It's time to define the shape of your robot



Analyse the blocked-out model

Some things to remember when blocking in:

- Gaps in shapes are fine – you can worry about these later
- The goal is to get a feel for the shape of what you're making. Hide your concept and ask yourself design questions
- Is your concept working in 3D? Does the 3D model look like something you want to spend another week or so working on? If any of these answers are no, experiment with what you have; try some new shapes or scale what you have differently.

03 Block in your base shapes Using the plane as a reference, start blocking in your key shapes. I create the torso first and make it the most detailed. Once that is done, I start adding in other pieces such as the legs and pipes in the back. This robot is going to be nearly perfectly symmetrical for most of the process, so it's important to only really work on half of it, you can mirror and weld it later. That being said, it's not a bad idea to copy what you have across to check out the proportions on the full piece as you progress **C**.

04 Detail the blocking shapes Pick a core mesh and hide the rest of the model. Start to detail out the mesh and get in some supporting edges so that it holds its shape when you apply the TurboSmooth modifier. When you approach subdivision hard-surface modelling, you will spend a lot of time looking for pinching and odd shading. To help you spot these errors easily, apply a base material with a high Specular and Glossiness setting. This material will enable you to get a better idea of how the forms will look when rendered later on **D**.

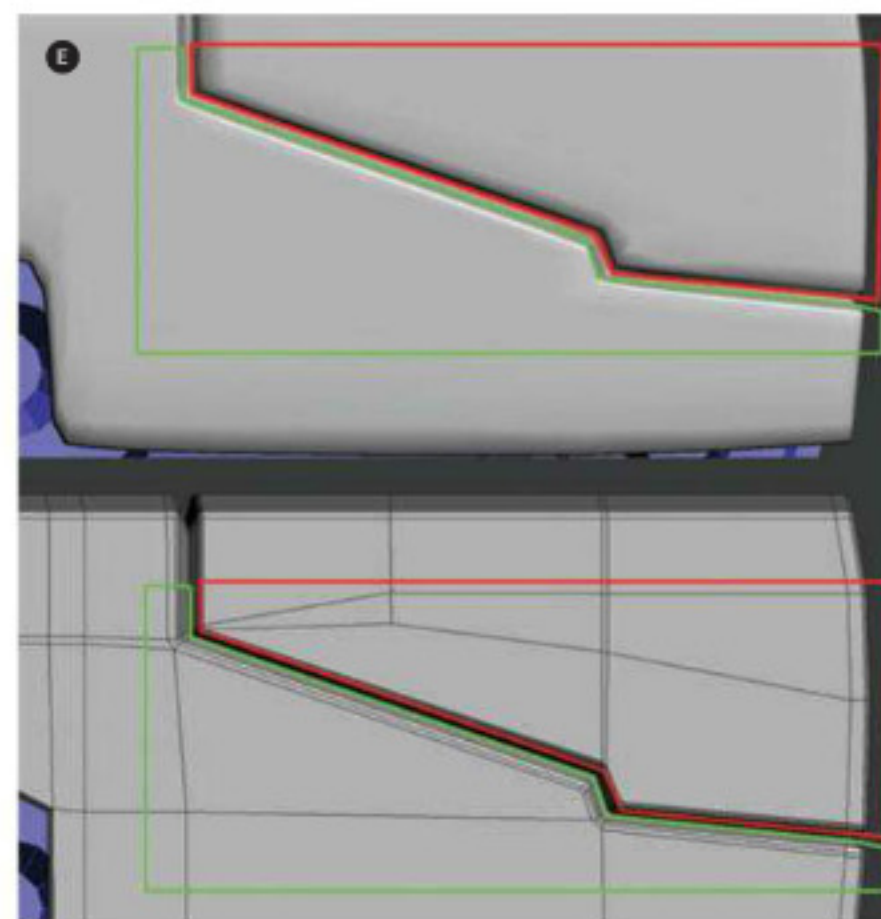
05 Add basic edge supports The most challenging part of hard-surface modelling is getting interestingly-shaped surfaces to subdivide correctly and derive a clean form. The next couple of steps will cover some geometry solutions I use for some common scenarios. In this example, you can see the shading along the crease of the surface in the red box has a shadow along the edge, the surface in the green below doesn't. The difference is due to the extra supporting edge added around the actual cut. This provides more support and flattens the surface quicker when smoothed **E**.

C Block in the basic forms to decide if your concept works in 3D

D Apply a shiny material to help you spot errors when subdividing

E Support your edges to get nice clean bevels

G Edge Constraint is one of the key hard-surface modelling tools



Artist Showcase

Niles Doubleday

Currently living in the state of Washington in the United States, Niles spends his days working for Airtight Games and his nights modelling to the sounds of dubstep. When he's not busy at the computer screen he enjoys riding his trusty bicycle and hanging out with good friends.

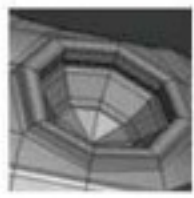


Cryogenics facility 3ds Max, Photoshop, Unreal Engine (2011)

This is a game resolution project Niles created to practise bringing the sci-fi themes of his personal work into the Unreal Engine

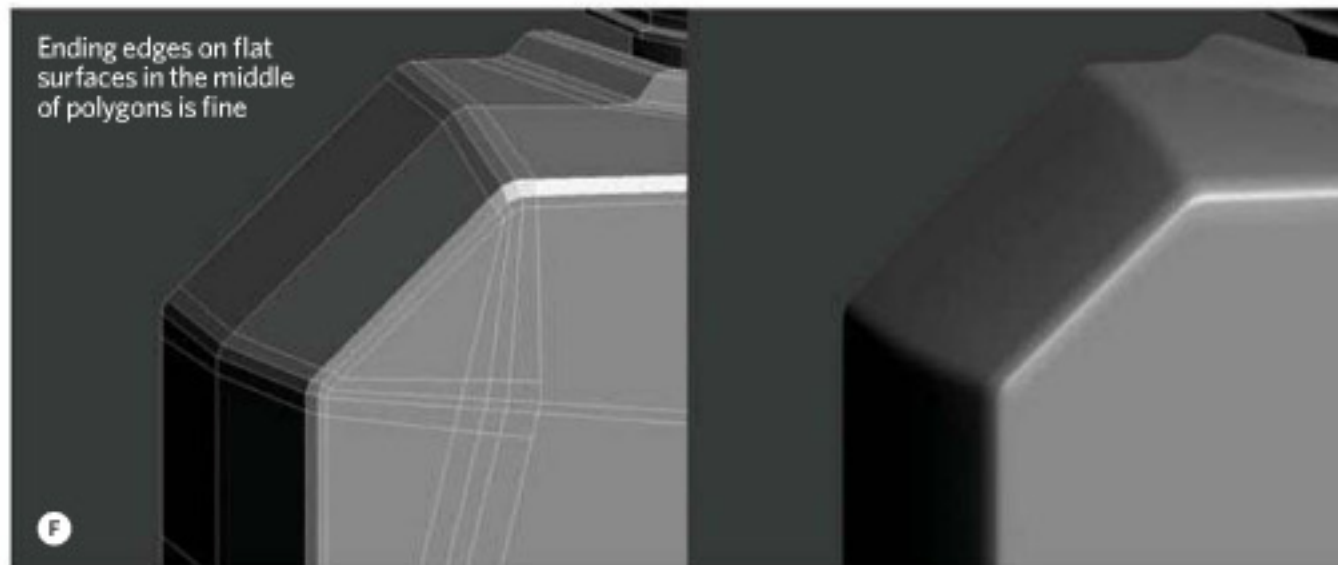
Sci-fi diver 3ds Max, Photoshop, KeyShot (2011)

This image was created as an exercise using the same workflow Niles is demonstrating in this tutorial



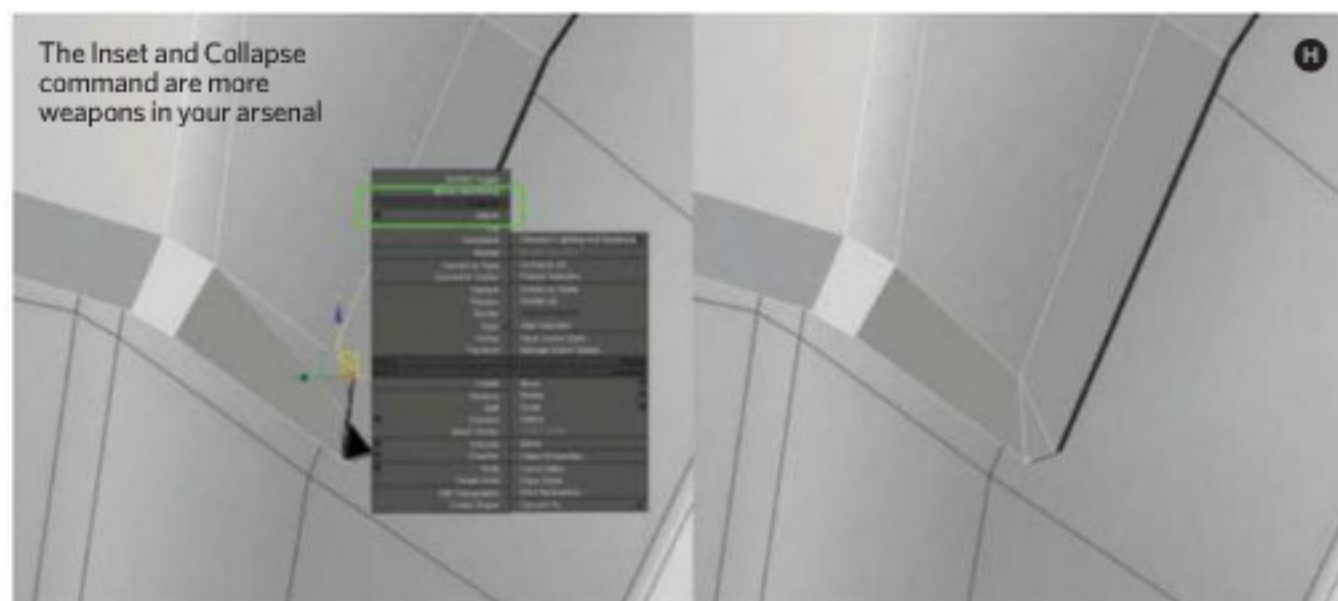
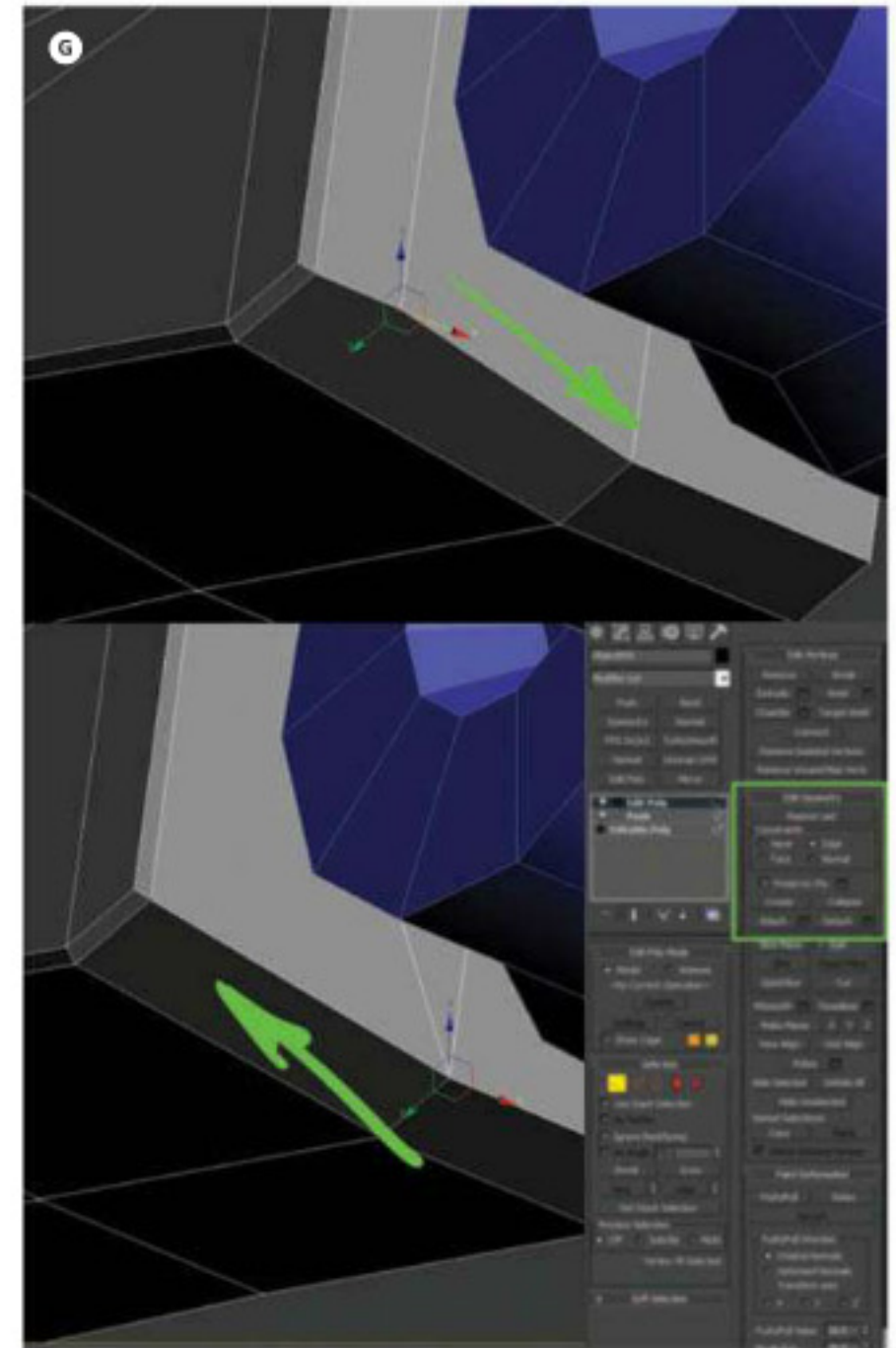
Add form and functionality

Place large and small elements for believability



06 Avoid extra work It's always important to model cleanly, however there are exceptions to every rule. In this case, since the side of this leg segment is perfectly flat, it's okay to leave edges ending in the middle of polygons. You can see that it still smooths out fine in the right-hand image. When you have edges end in convenient places, rather than carrying them all the way into an Edge Loop, this saves a lot of time and keeps the model a little easier to manage **F**.

07 Constrain edges Most important is the ability to easily move a vertex along an edge. Turn on Edge Constraint under Constraints on the right, found in the Edit Polygon modifier. In the image I have a vertex that is interrupting a smooth flow on this bevel. To fix this issue, turn on Edge Constraint and slide it to one of the end vertices, then slide it back along that edge to the correct location. Now it'll be in line with the intended surface and won't create any odd bumps **G**.



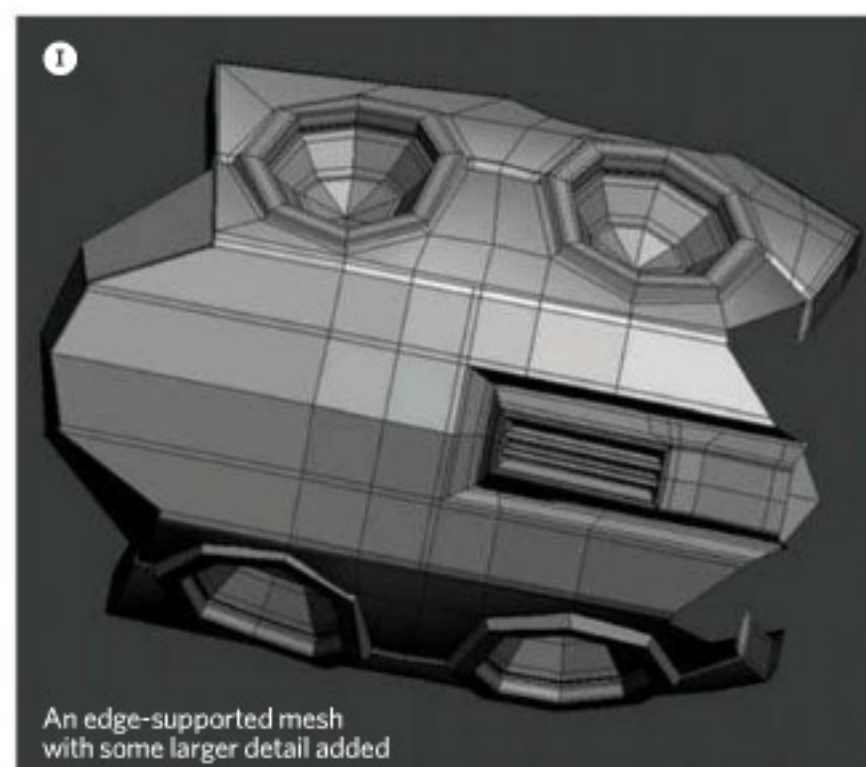
08 The Inset and Collapse tools The Inset tool is very useful for adding Edge Loops to support edges and add detail. Sometimes when you add an inset it creates overlapping vertices in sharp corners. This doesn't work all the time, but most of the time just collapsing that will enable you to keep your sharp corner and smooth surface without noticeable pinching. Easily navigate to Collapse by right-clicking and finding it on the pop-up menu **H**.

Surface type

As you continue to model, defining surfaces and details, keep in mind what kind of material the pieces are made out of. If you add really sharp edges and flat, smooth surfaces, the material will appear to be much harder. Rounder edges with big bevels and a more supple surface will appear softer. It's important to have a couple types of surfaces in your model. I like to have the sub-surface feel softer, with the exterior pieces being hard plastic or painted metal.



Alien spine
ZBrush,
Photoshop (2012)
Inspired by the Alien franchise, Niles made a quick ZBrush sculpt before rendering the different elements in ZBrush with various MatCaps and compiling them in post-production using Photoshop

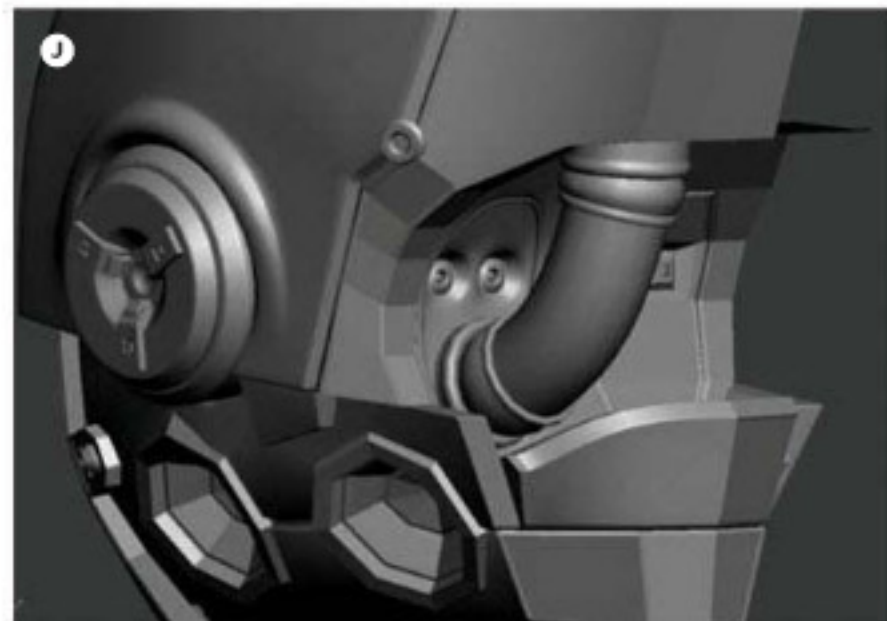


09 Place large details and new forms

When supporting the edges and defining the design further, I always start to add large-level detail, such as big vents or tube connections. As you add the detail, make sure the new shapes fit in with your existing large shapes. As an example, here is what the underside of the body looks like with the four leg-attach points and the vent underneath. Details such as this add an extra layer of believability and display function. The more the viewer can relate the forms to real-world things, the more believable your design will be **I**.

Polish the model

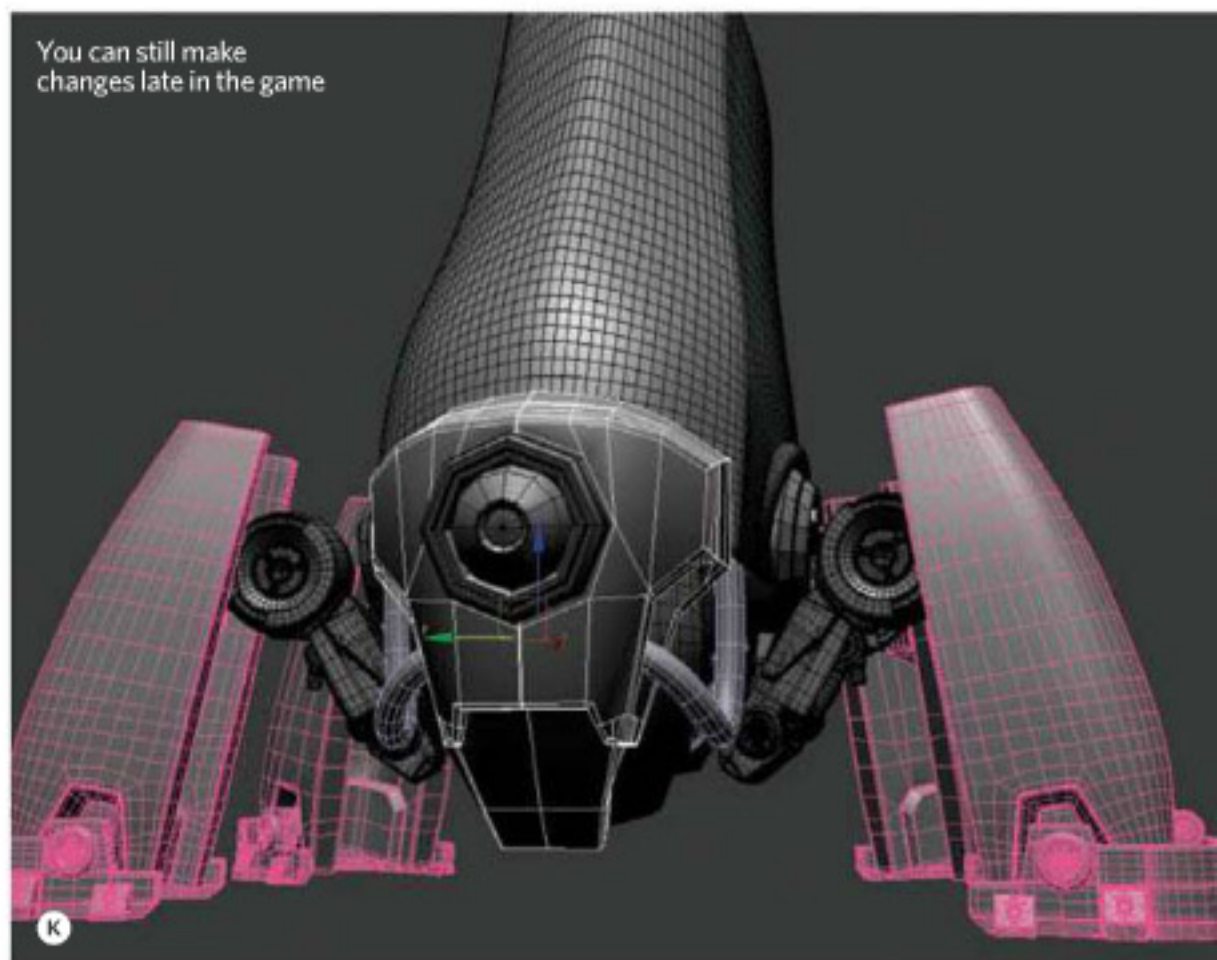
With all the basic meshes complete, bring your creation to life



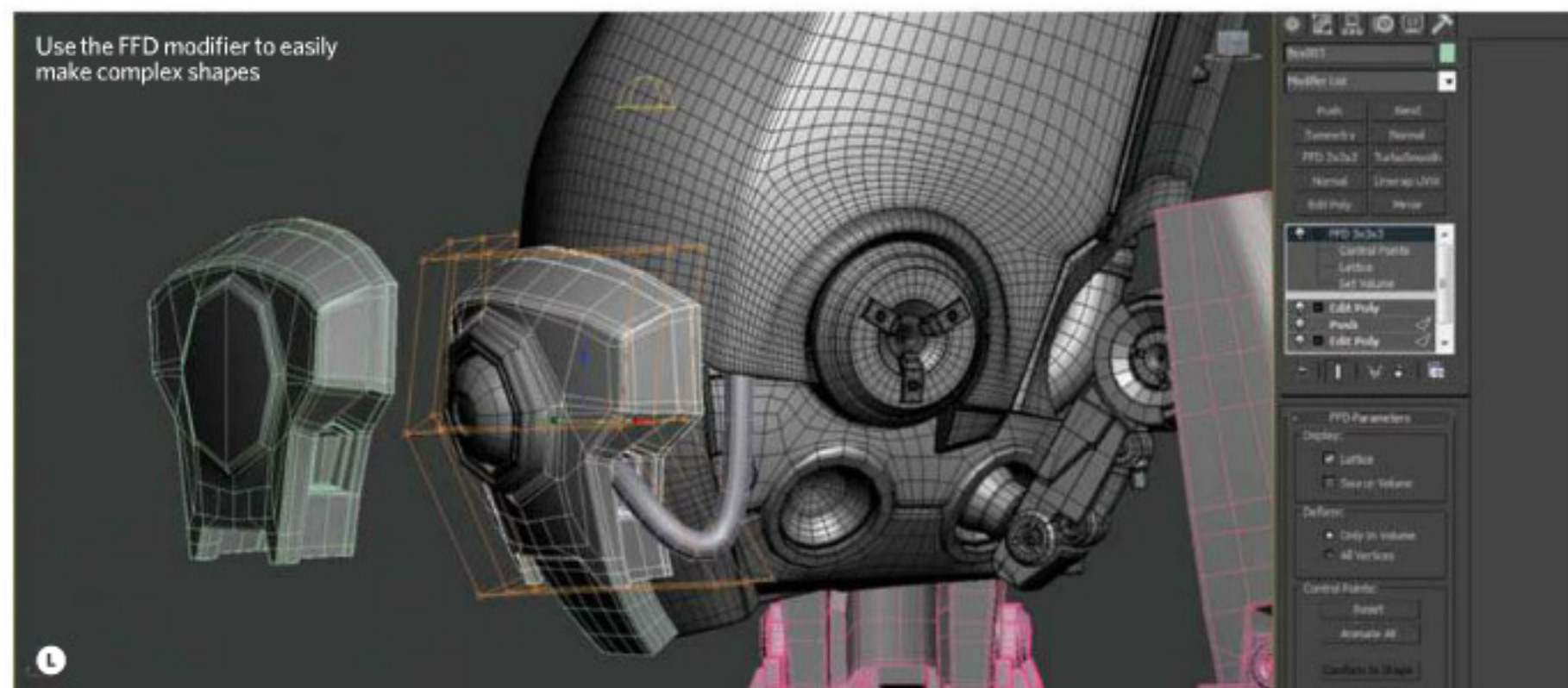
10 Fill in the gaps Now that you have all the major forms nailed down, there are probably some gaps still left between pieces. Now is a good time to fill those gaps. Use the same workflow as the other pieces to make a sub-surface. Block in some base shapes that intersect with the large forms you've got. Try to make these new shapes match the design of the existing ones as much as possible. In my case I have matched the arch of the rear tubes with a rear guard **J**.

11 Get feedback and adjust accordingly

Show your model to the client, or friends whose opinion you value, and ask for feedback. In my case it became apparent I needed to better illustrate a face and show more character. I started blocking out some shapes to see what would fit in with my existing structure and provide a more interesting focal point. It's okay to make big changes to your model, even at this late stage in the process. I push the main lens out and add some representational plating, as well as a couple of spline-based hoses. These add mid-level detail by externally attaching them to the body of the machine **K**.



You can still make changes late in the game



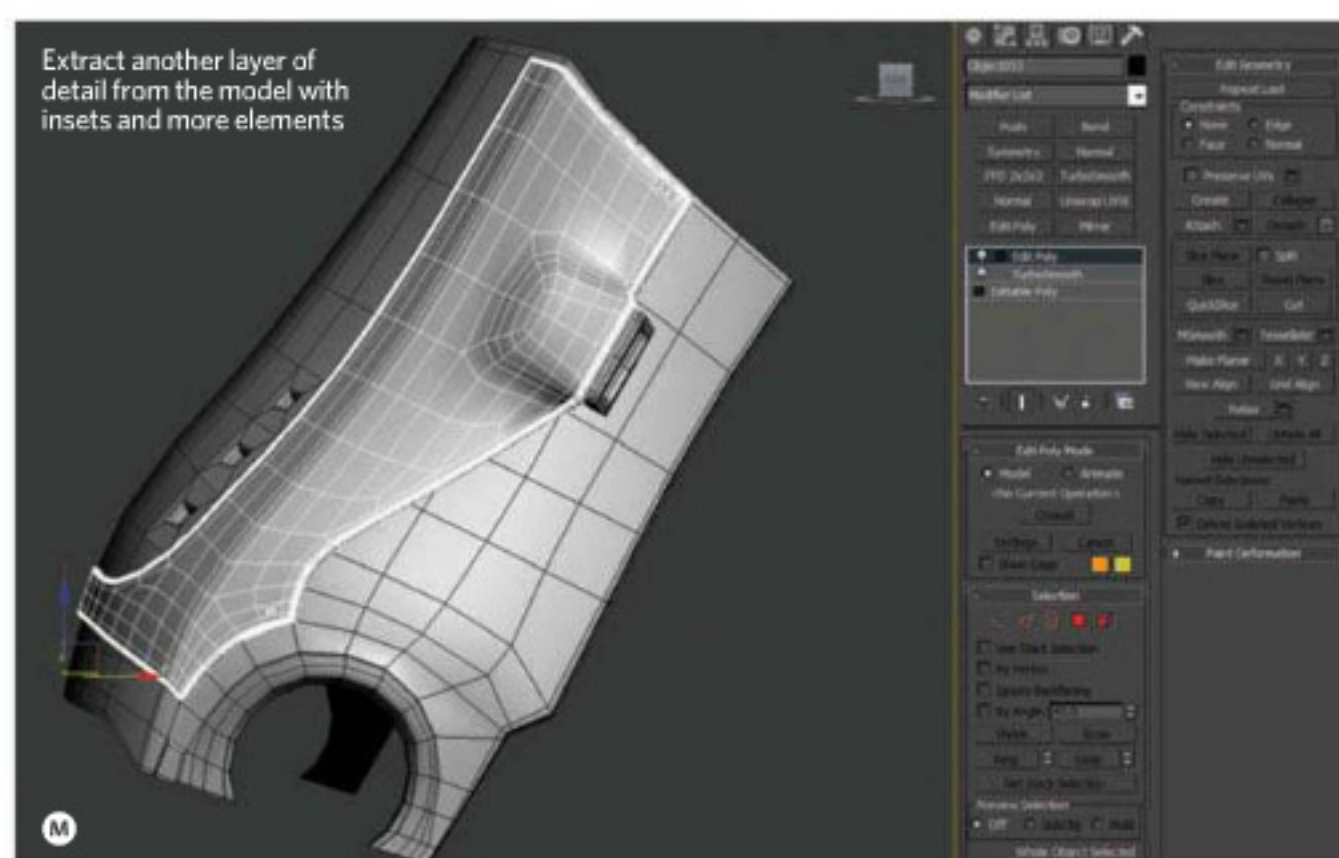
Use the FFD modifier to easily make complex shapes

12 FFD modifier After I defined the face, it became apparent that the shape would be very time-consuming to model in its curved form while still avoiding errors when subdividing. This is a perfect case for the FFD modifier. To use it effectively, model out your form flat to a world axis where you can get the mesh to subdivide easily. Next, reference that mesh and drag it to the location it's needed. Once your flat unsmoothed mesh is in place, use one of the FFD modifiers to bend it into shape. Last, go back to your on-axis mesh and use TurboSmooth **L**.

13 Final detail pass The last phase of modelling is where you really get to add some life to the model. Take elements that you think need another layer of detail, subdivide them, then apply another Edit Poly modifier. In the new modifier, start adding some insets, bolts or seams in key places. Another method is to select a bunch of faces and Shift-drag them off of the mesh to create a new sub element. Add a bit of thickness to this new element to create a layering effect **M**.

Design your fine details

Fine detail of the model is what really makes it come alive, taking it from a 3D model to something believable. The really important part is to use the detail to add hints of construction and fine seams where the plating comes together or is attached. I've also added little divots to suggest vents or attach points. Use this opportunity to better support the large forms. With the plate, for instance, I've added highlights to the slight curve of the front as well as conforms to a new vent along the side.



Extract another layer of detail from the model with insets and more elements

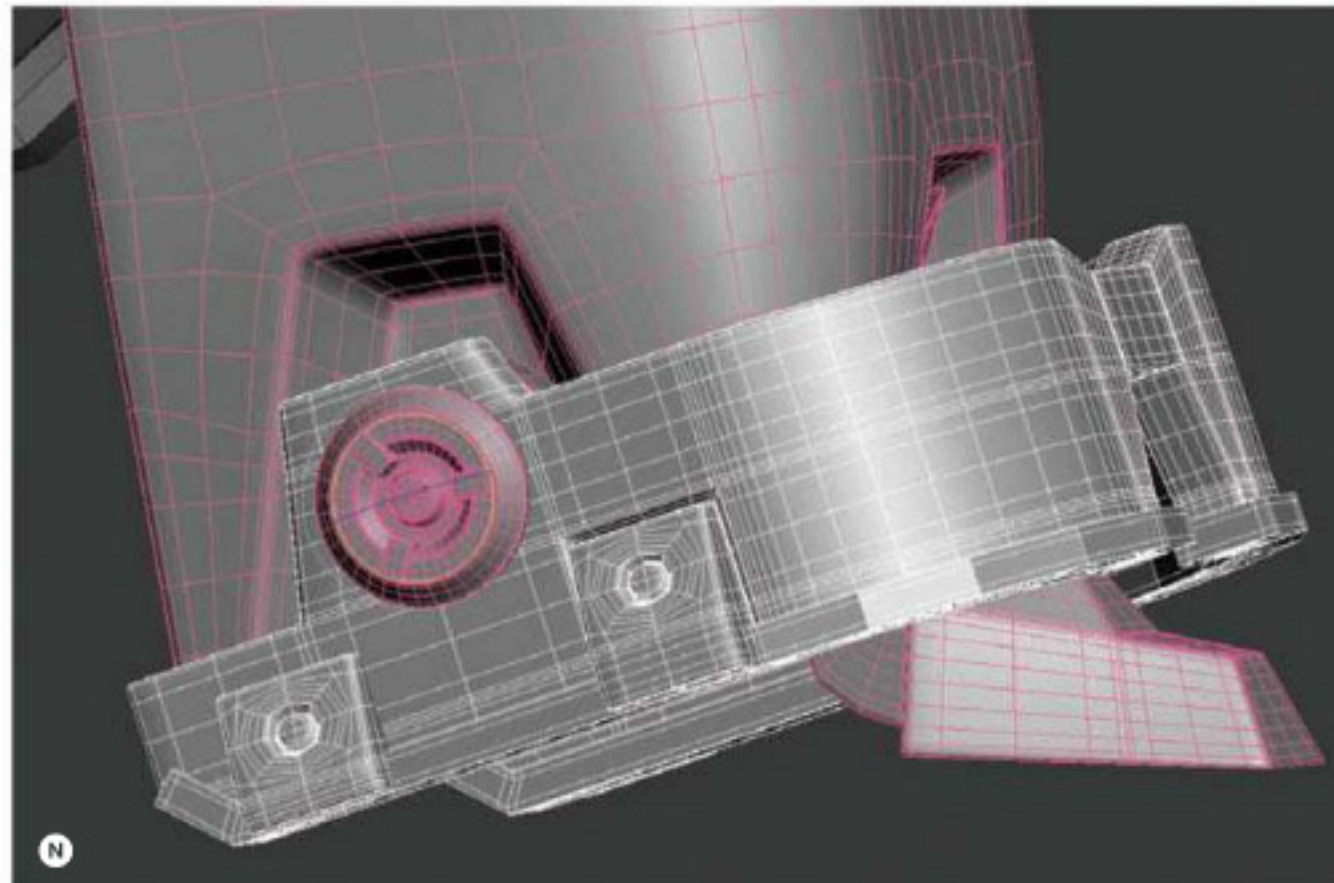


Pose and render

It's time to make that model into a polished image

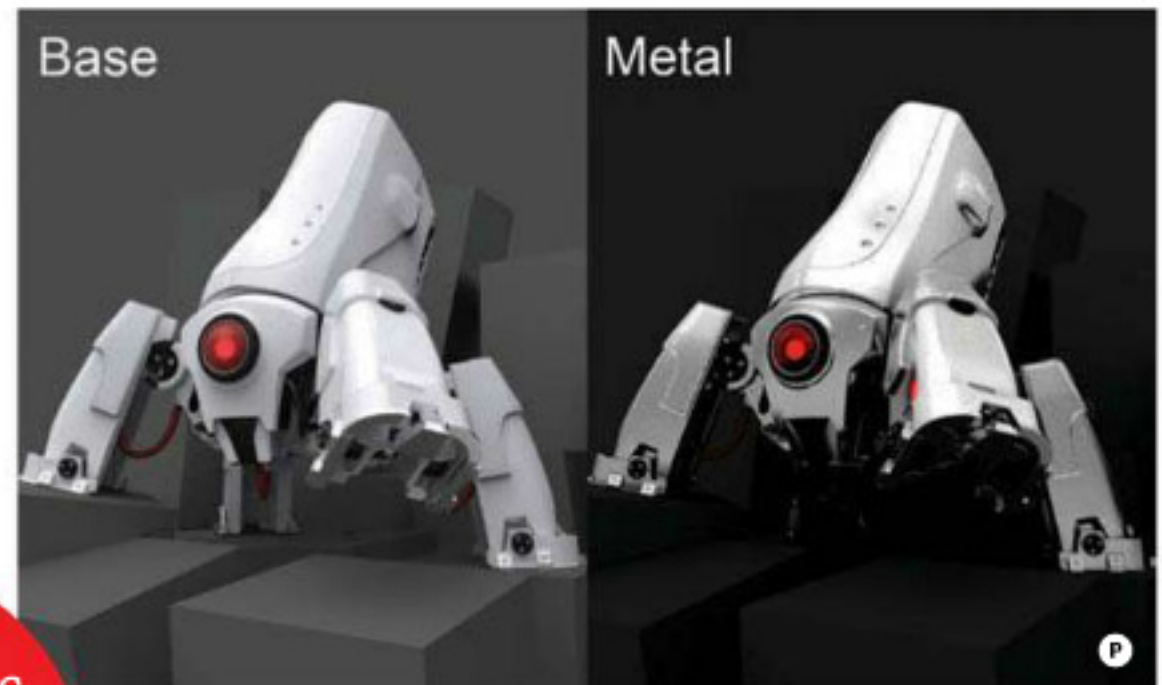
14 Set up a hierarchy At this point your model is all finished and you need to put it into a cool pose for rendering. To make that posing easy and avoid making a full bone rig, set the pivot points for the meshes where the joints are. Parent the meshes in the way you would expect the robot to bend. For example, in the screenshot I've shown the foot plate being parented to the lower leg **N**.

- I** Fill in any gaps that may have appeared between the forms
- N** Parent the meshes to one another at the joints to make posing easy
- P** The base render and sub-surface render



Rendering in KeyShot

KeyShot, formerly known as HyperShot, is a really great piece of rendering software. I like to use it because it enables me to focus on my model without worrying about spending lots of time setting up an HDRI and complex shaders. I'm actually using an old version, so I have to break up the different materials into separate meshes to import it into the program. With the latest version (a free demo is available) you can import your MAX file straight in. This enables the material IDs from 3ds Max to be transferred and makes material selection and organisation very easy!

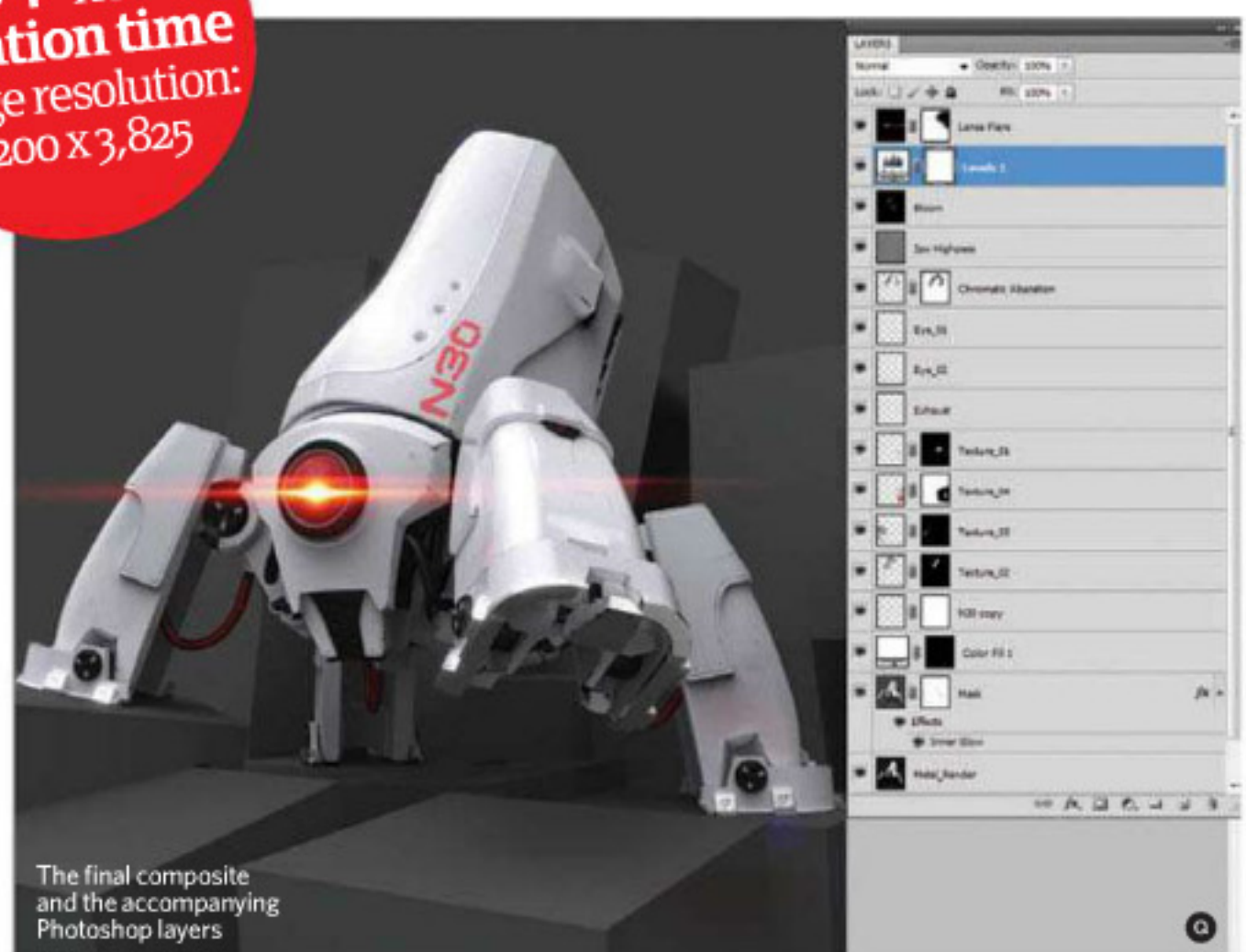


15 Build up the scene Switch the Rotation to Local and start rotating the base into position. All the legs and head should follow if you've parented them. Next, rotate the legs and head to suit the camera and the scene. I've set up a bunch of boxes to give the robot some context, but sometimes a flat plane works. I generally play around with a few different camera angles and poses **O**.

20+ hours creation time
Image resolution: 3,200 x 3,825

16 KeyShot rendering I've chosen KeyShot to render this scene, but any renderer that gives you easy access to a broad range of materials will work well. It's a good idea to try out different materials and colours until you find the best results. I knew that I wanted some chipped-away paint that would reveal a metal surface underneath, so I make an additional render that is entirely metal. In Photoshop I take the metal image and add more contrast using the Levels adjustments **P**.

17 Move to post-production In Photoshop I start by copying the base render onto a layer above the metal layer and painting a mask where I want scratches, so the metal shows through. Other important elements are Bloom and Sharpening. For Bloom, copy the merged layers onto a new layer and use Levels to drag the darks almost all the way to lights to clamp it. Use the Gaussian Blur filter (6-10 pixels) then set the Blending mode to Screen. To sharpen, copy the merged layers and apply a High Pass filter with a low pixel count and set it to Overlay **Q**.



The final composite and the accompanying Photoshop layers

Questions & answers

Welcome to the Q&A section where we answer many technical quandaries in the popular 3D programs, including Maya, ZBrush, 3ds Max, V-Ray, SketchUp and more

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3ds Max, V-Ray
Patric Verstraete
www.vizcon.be



Patric is a CG and 3D artist based in Belgium. He originally started out as a freelancer back in 2009, but he now heads Vizcon3D, the successful arch-vis studio

On the Disc

Advanced Digital-Tutors video training from the Transforming Robot Production Pipeline series

Maya, ZBrush, TopoGun

Model a robotic head

“How do I model a robotic head with multiple contoured panels and layers?”



All-in-one 3D applications like Maya provide powerful tools to create just about anything you can imagine. Even so, some

models provide challenges that are better attacked with a multi-pronged approach. For example, modelling a multi-panelled robotic head like the one from the ‘Transforming Robot Production Pipeline’ series can be a difficult task. Leveraging the strengths of a few different software packages can make the job much more manageable and quicker to complete.

One of the issues with building a model like this comes from the fact that there are a number of overlapping and interlocking panels layered above and below one another. To make matters worse, the shape and design of each of these panels often has little to do with the overall shape

and topology of the base head. This means that the edges we might use to define the shape of the head may not prove all that useful when extracting or creating the layered panels. Due to the somewhat arbitrary edge flow on the panels, trying to build one perfect piece of head geometry and then cutting it apart can become very difficult and the clean-up of the oddly placed edges can be tedious.

Because of this disconnect, it can be helpful to create a separation between the shape of our robot’s head and the topology of the fitted panels. By including a sculpting application like ZBrush in our workflow, we can create a seamless high-resolution blank in the shape of the head. Tools like DynaMesh, Trim, Polish and the Clipping Brushes can make this process a quick one, with a lot of flexibility



in getting a good overall shape for the head structure.

We can then use various tools to layer arbitrary topology on top of this high-resolution head shape in order to create any number of individual panels that follow the overall design. These panels can



SketchUp, Maxwell Render

Ross Board

www.rossboard.co.uk



Ross is a design and planning specialist currently working within the renewable energies sector. He has plentiful experience with high-end arch vis

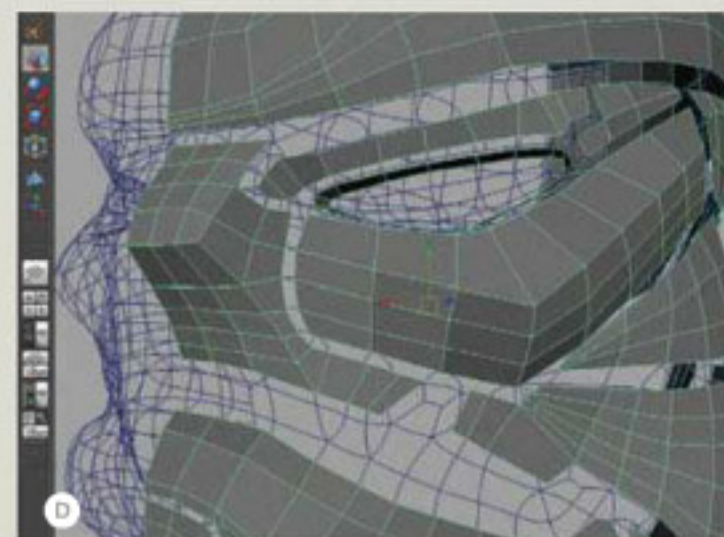
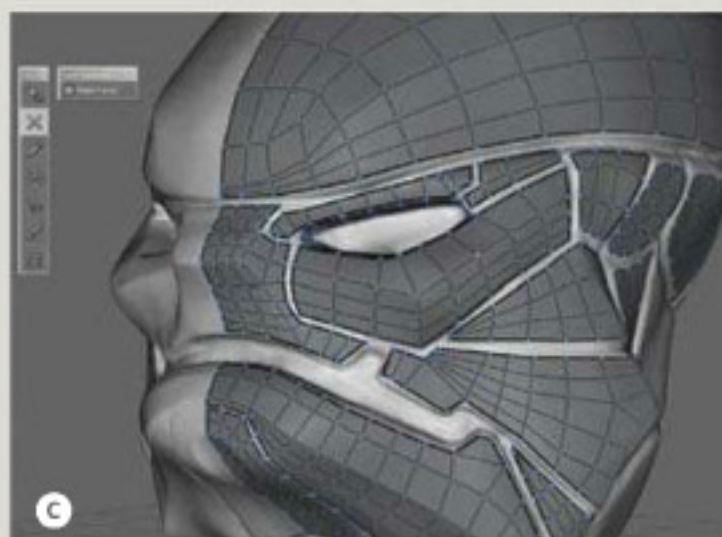
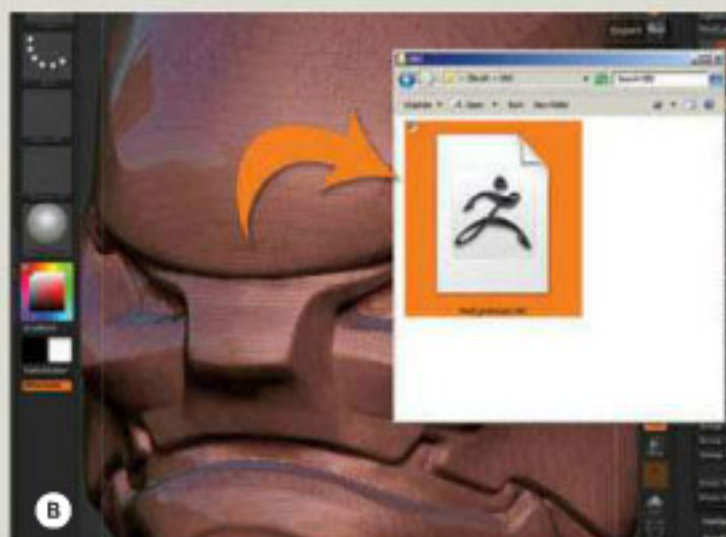
Send us all of your 3D problems and we'll get them sorted. There are four methods to get in touch with our team of expert advisors...

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then be further modified and additional details created through traditional modelling means.

This workflow will enable us to use very artist-friendly tools to work out the overall head shape without concerning ourselves with the technical aspects. We can then switch over to more technical modelling, but without the concern of trying to match a particular shape or making all of the panels visually mesh. ZBrush, TopoGun and Maya are great tools for this type of work, but the techniques used can be applied using other applications as well.

01 Block out the head

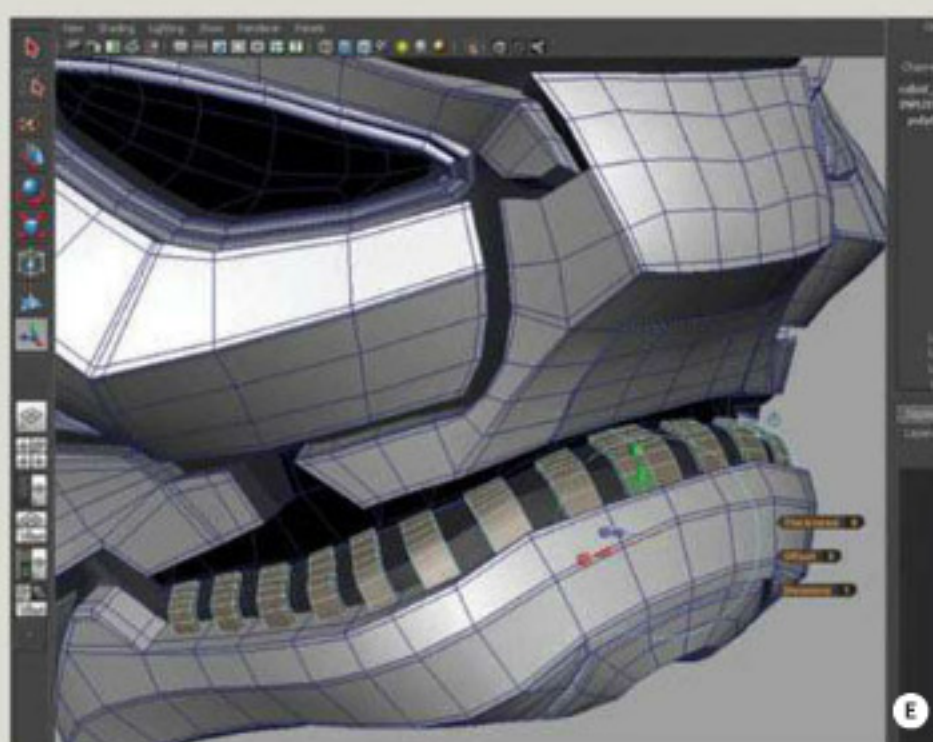
Start by creating a simple base mesh, either by importing geometry into ZBrush or by using one of its many mesh-creation tools. Modify the rough shape based on your design and begin sculpting in the features. The Trim and Polish brushes will help to create smooth contours bound by sharper creases. It doesn't have to be perfect at this stage. Create your overall shape without thinking about the panels **A**.

02 Finish and export

When sculpting your high-resolution head, don't worry about all of the details you want to eventually add. Just try to get some clean lines and a good overall shape. Parts like the eyes or other smaller details can wait until later. Once you're happy with the sculpt, it's time to export the model. Export a high level of the ZTool as an OBJ in preparation to create the panels **B**.

03 Create panel layers

Now bring your high-resolution mesh into TopoGun and begin drawing new topology



on top of the reference geometry using Simple Create, Draw, or your tool of choice. Break down the panels into layers based on the concept art and create a file for each layer, saving them out as needed. Include a base level that is airtight to use under your other panels. Alternatively, you can use the Topology tools in ZBrush to complete this step **C**.

04 Detail the panels

At this point, bring the exported OBJ layers back into Maya starting from the inside out. When importing each successive layer, move the points out along their normals until they rest on the geometry below. Extrude the panels to the required thickness. If you want to smooth your panels, make sure you add enough resolution along the edges to create the required sharpness. If not, you can always bevel the panel edges **D**.

05 Extract detailed pieces

The panels you've created, as well as the underlying base geometry, can serve as a great starting point for more detailed geometry. For the teeth you can extract a portion of the mouth geometry. Smoothing it will give you more divisions to work with so you can then delete alternating loops of faces. Extrude the result and you'll get a number of small raised strips that follow along with the existing contour **E**.

ZBrush alternatives

Another option to create your head panels is to use ZBrush's new tools. There are a number of features in ZBrush 4R4 that can help. By selecting a ZSphere, binding to your high-res mesh and activating Topology, you can create geometry on top of your existing mesh. Once done, you can create an Adaptive Skin out of the panels with or without thickness. Alternatively, the Topology Brush will quickly draw out panels on the head. As the lines cross, vertices and then faces are created. Click to create the geometry with the thickness driven by the brush size.

06 Add final details

At this point you can begin adding smaller pieces that are more readily built in Maya. The eyes can be created from spheres that can have portions extruded to give a robotic look. Radial details can be added around the outside or inside of the pupil to add to the effect. You can also add some small ridges around the eyeball to fit it better within the socket and add to the mechanical look **F**.



Questions & answers

Welcome to the Q&A section where we answer many technical quandaries in the popular 3D programs, including Maya, ZBrush, 3ds Max, V-Ray, SketchUp and more

3ds Max, V-Ray

Volumetric lighting

“How can I get more control over volumetric lighting in 3ds Max without an extra pass in the base render?”



One of the most dramatic 3D scene-lighting effects is volumetric lighting.

This light provides effects based on the interaction of lights with the atmosphere (fog, smoke and so on). Volumetric lighting also adds realism and drama to your images, so it becomes more believable and compelling. It can add drama and depth simulation. You can also use volumetric lights for glows, shine effects and dramatic backlighting.

V-Ray's environment fog is quite realistic in its behaviour. It works a lot like real particles in the air. So even in areas without direct sunlight where you see beams of light, you will still get fog lit by the ambient bounce light in the scene. For the interior you need to make sure your light intensities are realistic values. If you don't, things will look hazy and probably a little flat.

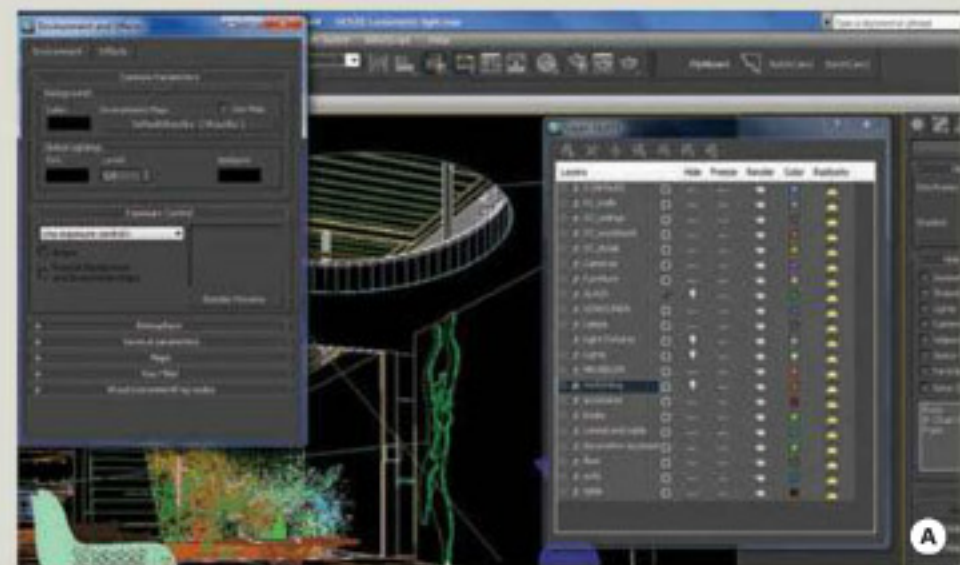
Try to imagine that your interior scene is a real set; you've fogged the whole space and now you're lighting it. It's all about the

density of the fog and the brightness of your lights.

A quick search on the internet will highlight lots of tutorials and samples about volumetric lighting and V-RayEnvironmentFog, but few answer the question how to get more control and freedom over the volumetric lighting effect without any extra passes in the base render. I prefer to keep maximum control when it concerns creating effects.

I wanted to use this effect in my latest personal project *L House* so I searched for a way to have an extra pass to tweak the effect in post-production. On the ceiling of the ground floor skylights were scattered to provide natural light coming into the spaces, so subtle and dramatic lighting (volumetric lighting) was essential to have in the final renders.

This method we'll discuss is simple and effective, and is split between achieving the effect pass and then post-production. So once you've finished a scene, follow these steps to better lighting.

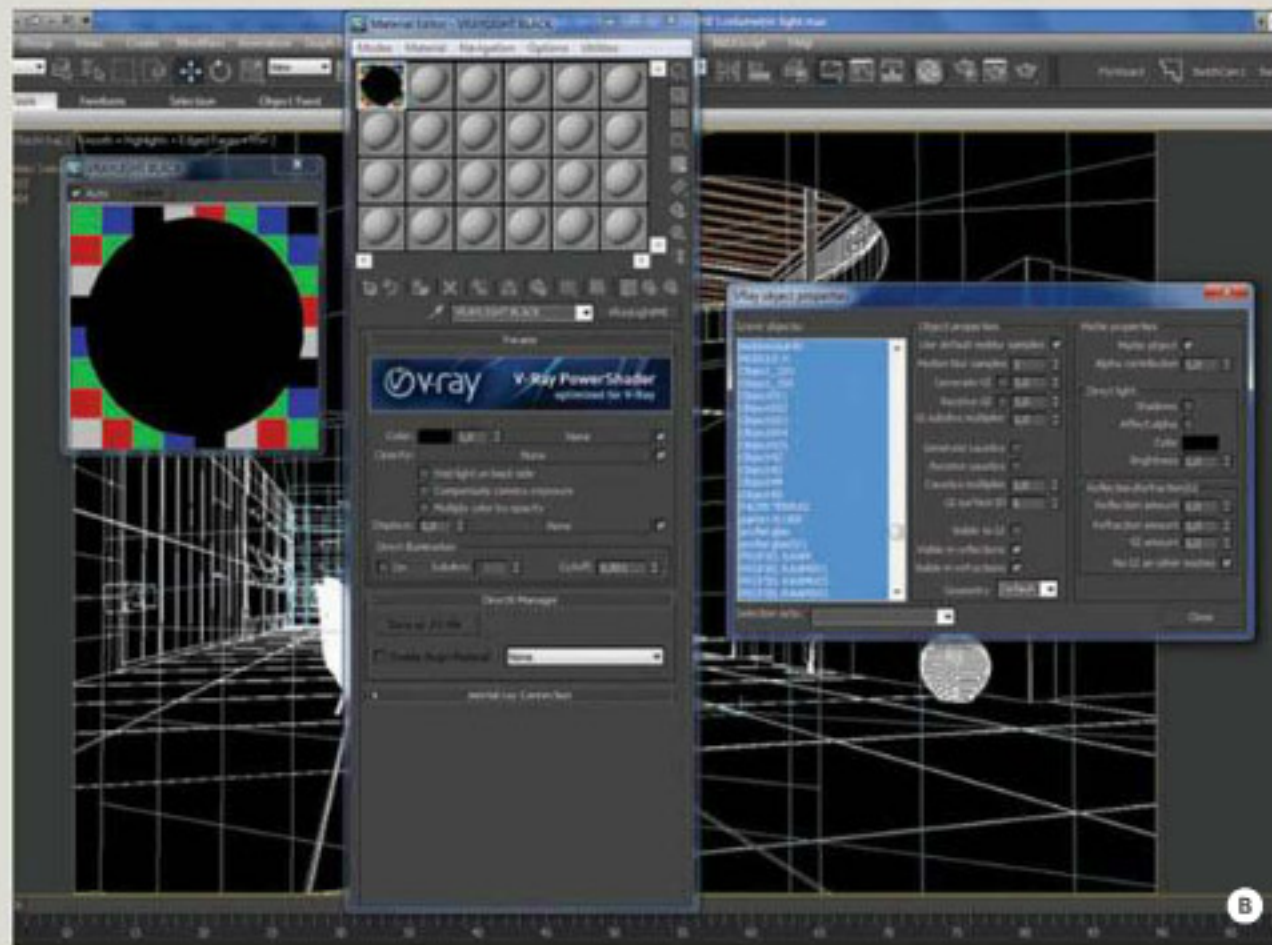


01 Turn off the lights

Make a copy of your finished 3D scene, delete all the glass objects and turn off all the lights – except the ones you want to affect the fog (like the sun, in my case). If you are using an HDRi or EXR environment map, turn it off. Remember, turn off all the lights except your main light source. I'm using V-RaySun/Sky so I need to enable the default V-RaySky map and change the background colour to black **A**.

02 V-Ray Object Properties

Make a new V-RayLight material with 100% black, select all (Ctrl+A) and assign it to the entire scene. Select all (Ctrl+A) the



geometry within your scene, right-click and go into the V-Ray Object Properties dialog. Enable Generate and Receive GI, as well as Generate and Receive Caustics. These settings control whether the objects will generate indirect illumination or not.

Another tickbox to activate is Visible to GI. When this is off the objects of your scene will be transparent to GI rays **B**.

03 Matte properties

Go to the next tickbox and check Matte Object. By checking this option, your objects will turn into a matte object. This means that the object(s) will not be directly visible in the scene; instead the background colour (in my project, V-RayLightMaterial 100% black) will be shown in its place. The object will appear normally in reflections/refractions and will generate indirect illumination based on its actual material **C**.

04 Set up the render

Press the F10 key to bring up the Render Setup dialog and make a few changes, as follows: go to Image Sampler and change this to Adaptive Subdivision for faster results; turn the Antialiasing filter (AA) off and go to the Settings tab to turn on Optimized Atmospheric Evaluation **D**.

05 V-RayEnvironmentFog

Now we have to configure the V-RayEnvironmentFog. Hit 8 on your keyboard, add the V-RayEnvironmentFog effect in the Environment & Atmospherics window and activate it. Go to Fog Distance; large values make the fog more transparent while smaller values make it more dense. I have set the Distance to 450cm. Change the fog colour to your

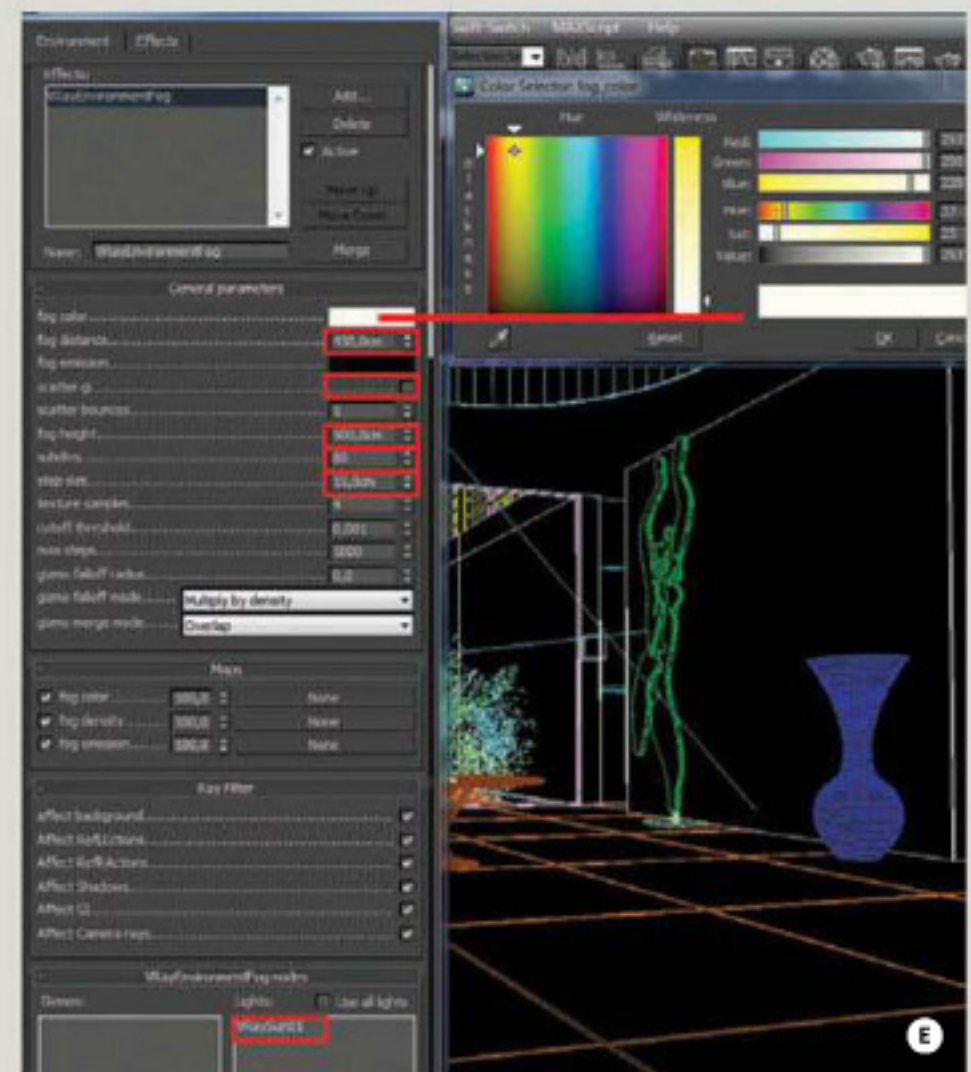
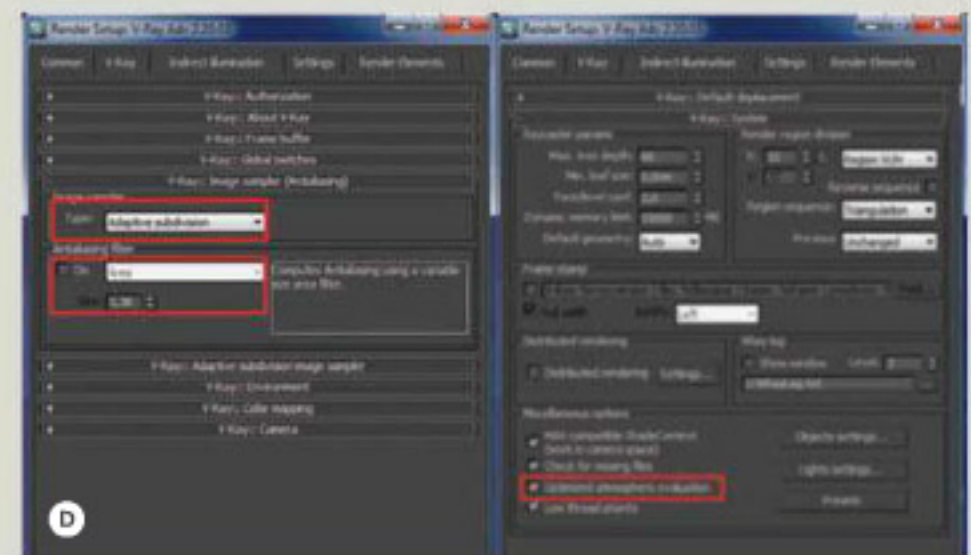
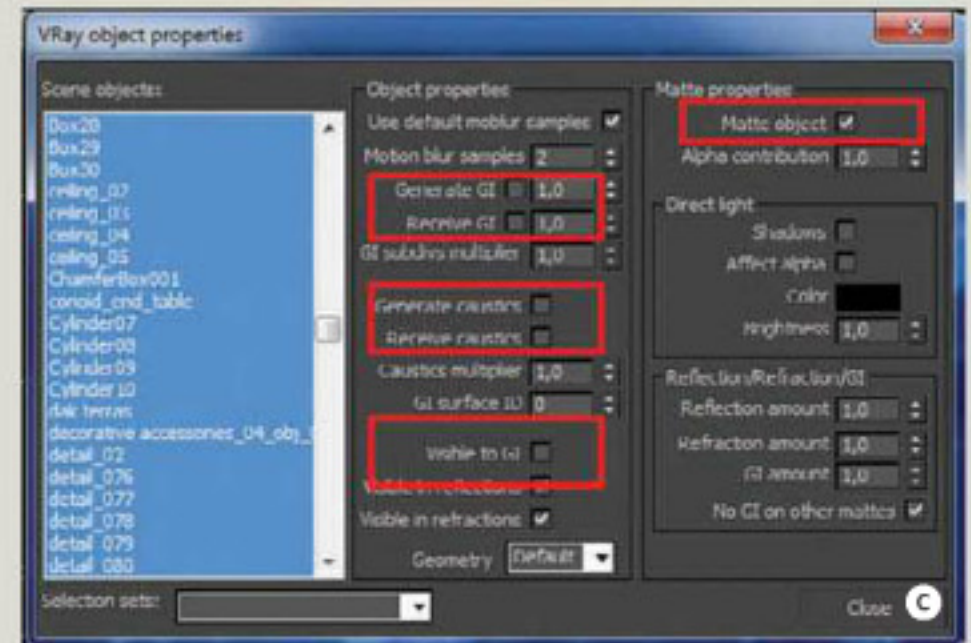
Catch some rays

The Fog Color and Fog Multiplier in V-RayEnvironmentFog are actually absorption controls. The light loses its energy while travelling through the material. The longer it travels, the more energy will be absorbed by the object. That's why thinner parts will remain lighter than the thicker parts. It's important that the light can travel through some other elements in the scene to make the volumetric effect more effective.

taste; it defines the colour of the fog when it's illuminated by light sources (I use RGB 253,250,228). Turn Scatter GI off – we don't want the fog to scatter the Global Illumination – and set the fog height to cover the whole building (I set it to 700cm). Change the subdivs to a reasonable value (80); higher values render longer, but with less noise. Set the Step Size to 1, or 20 to 30 times smaller than the Fog Distance parameter, for good results. Scroll down to the V-RayEnvironmentFog nodes, there you can select your lights to contribute to the illumination of the volume. Select V-RaySun01 (the main light source). To finish, hit Render (F12) **E**.

06 Move to post-production

Go into your favourite post-production program (I personally use Photoshop) and apply the layer with a blending mode set to Screen or Linear Dodge. To tweak the fog you can use the Levels tool to strengthen or lower the intensity. For best results, place the sun in the direction of the camera. Doing this disperses the light in a dramatic and effective fashion, adding character to your scene **F**.



Questions & answers

Welcome to the Q&A section where we answer many technical quandaries in the popular 3D programs, including Maya, ZBrush, 3ds Max, V-Ray, SketchUp and more



Improve your renders in SketchUp

SketchUp, Maxwell Render

“How can I improve the quality of my renders in SketchUp?”



SketchUp is undoubtedly one of the best 3D tools on the market.

A controversial statement, maybe, but it's clear that the package's simplicity coupled with an easily attainable free version has resulted in unprecedented success following its introduction into the market back in August 2000.

Rendering, however, is far from SketchUp's strong point and it's with this that rendering and simulation software specialist Next Limit Technologies intervenes with a SketchUp release of its market-leading, unbiased rendering engine, Maxwell Render.

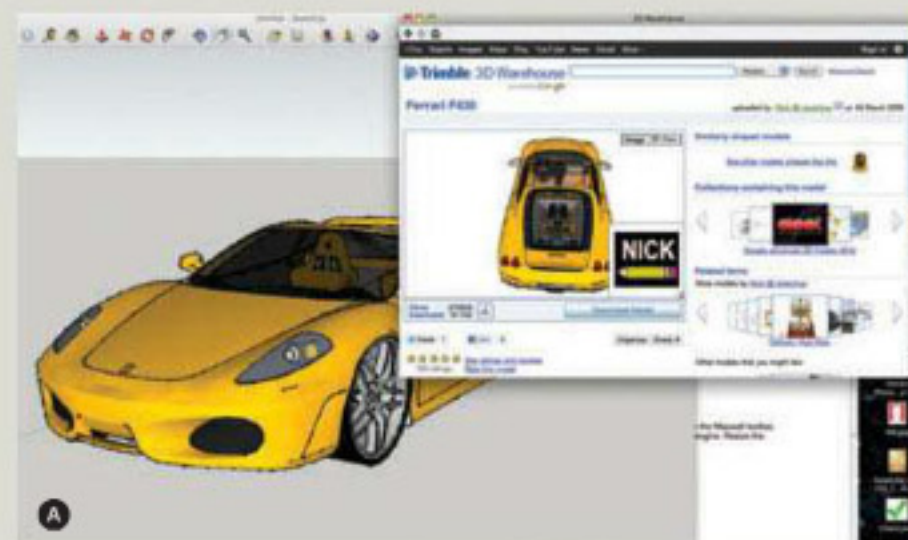
Maxwell Render has been tried and tested at the highest level by professionals and has an admirable industry pedigree, with the standalone release being used on countless high-end projects. The SketchUp release takes an interesting and slightly abstract tone however, offering a limited resolution version of Maxwell's incredible engine to users for absolutely nothing, with an unlimited and fully

functional version available for the modest price of just €99 EUR.

Mac users can also rejoice, since Maxwell Render is available for both Windows and OSX – each acting as a plug-in directly within SketchUp (of which free and Pro editions are supported).

Maxwell Render is based exclusively on the concept of unbiased rendering, which bounces rays of digital light an infinite number of times until satisfactory quality is achieved – otherwise known as physically correct rendering. It's important to note that rendering engines such as V-Ray don't function in the same way; these usually cache light bounces before rendering so as to speed up the calculation, often resulting in a slightly different effect.

While Maxwell for SketchUp's settings aren't anywhere near as expansive as its standalone counterpart, the higher-priced Maxwell Studio, it's still perfectly suited for its purpose, being simple, lightweight and effective. It fortunately offers users access to some of the most powerful features



previously associated with the far more costly and complex edition of the engine, such as the incredible MXM material library.

This tutorial aims to give a brief introduction to the free edition of Maxwell for SketchUp and some of the underlying concepts used to achieve a reasonable quality render out of the box. These include modifying a SketchUp Warehouse model to suit Maxwell, physical/HDR lighting, the MXM material library, Maxwell materials and the Maxwell Fire rendering engine. It's all delightfully simple, comprising of easy-to-understand settings and configurations. You should expect to have a solid working grasp of Maxwell Render by the end of these steps.

Iterative rendering

By its very nature, unbiased rendering is an iterative process that can potentially continue infinitely, adding even the most minute details as time progresses. Users will notice that Maxwell Render requires approximately five to ten minutes to achieve something presentable (depending on computer hardware), in order to achieve those stunning results. It should be understood that a substantial amount of time is required for this. Arguably though, it is worth the wait, since the end results appear beautifully photographic and will certainly rival the closest competitors.

01 Download and install

Go to www.maxwellrender.com, choose either the free or paid release and download the appropriate version of Maxwell for SketchUp. Once installed, open SketchUp as normal and you should be greeted with a few additional floating toolbars denoting newly installed Maxwell's settings. Open an appropriate test model to continue; we have used a free Ferrari F430 model from the Trimble 3D Warehouse (model supplied by 3D Warehouse user 'Nick @ Sketchup') **A**.

02 Initiate Maxwell Fire

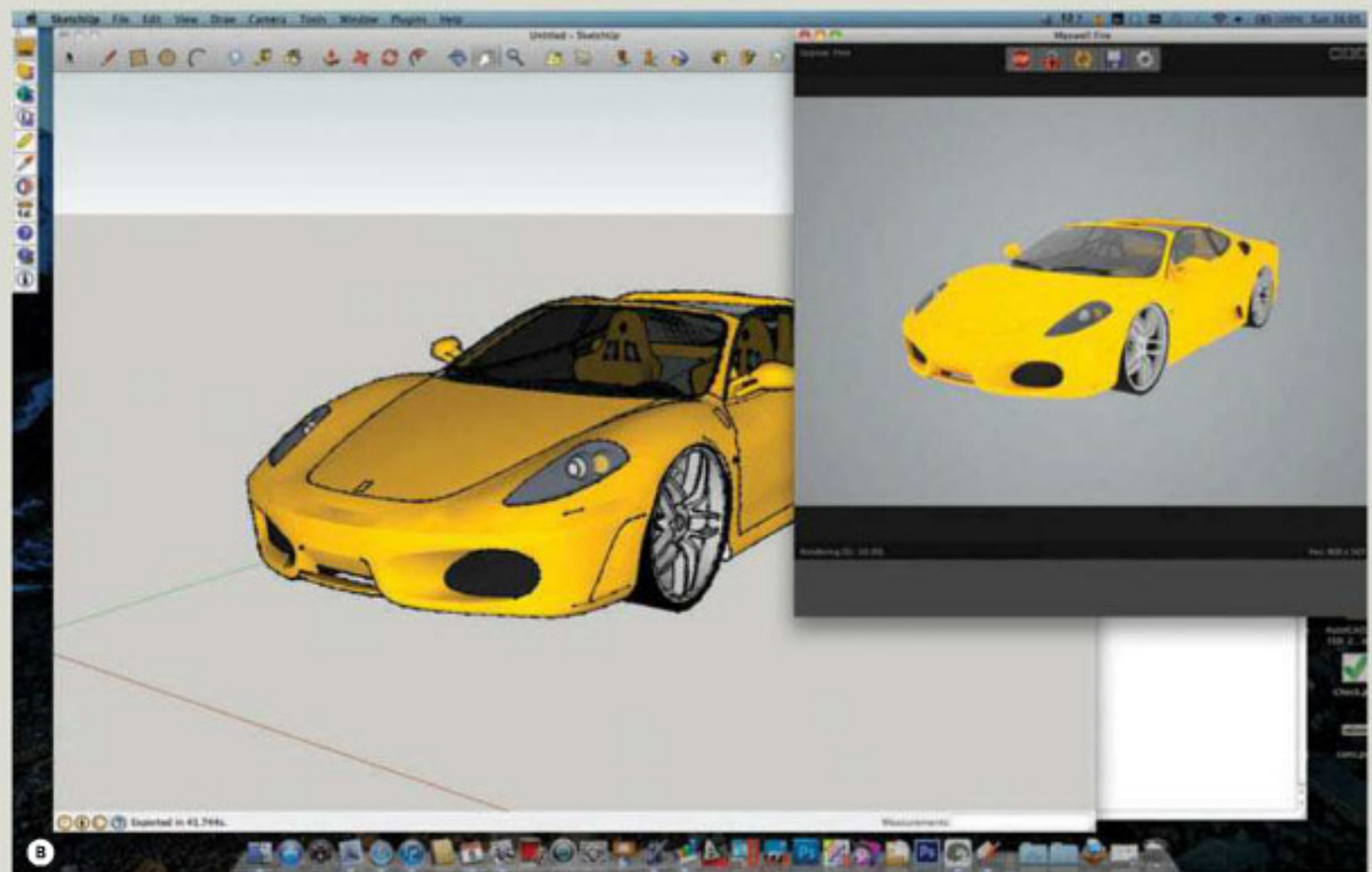
Press the orange fire icon from within the Maxwell toolbar, which should initiate Maxwell's real-time iterative rendering engine. Resize the window according to your available computing power (a larger window equals a more processor-intensive preview rendering) and you should see a rather flat-looking interpretation of your current viewport/camera. Don't panic at this stage, as Maxwell is basing this on a global skylight with no floor plane **B**.

03 Assign materials

Open the Maxwell Scene Manager by clicking Plugins>Maxwell>Scene Manager or by clicking the pencil icon from within the toolbar. The Material Editor tab should be open as default. Click the pipette icon and choose the object containing the material you wish to edit; in our case the car's bodywork. Once selected, the material should become active. Play around with the material's Character settings such as Type, Color, Bump and so on. We have selected the Car Paint preset **C**.

04 Add lights

While progressing, the rendered preview still doesn't look quite right due to the absence of any reasonable lighting. To rectify this, select the Environment tab from within the Scene Manager and first enable a



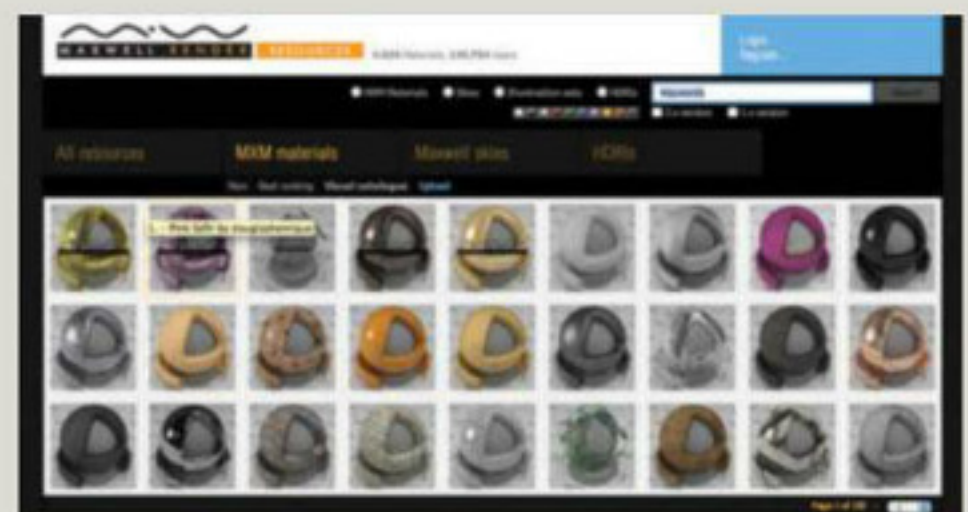
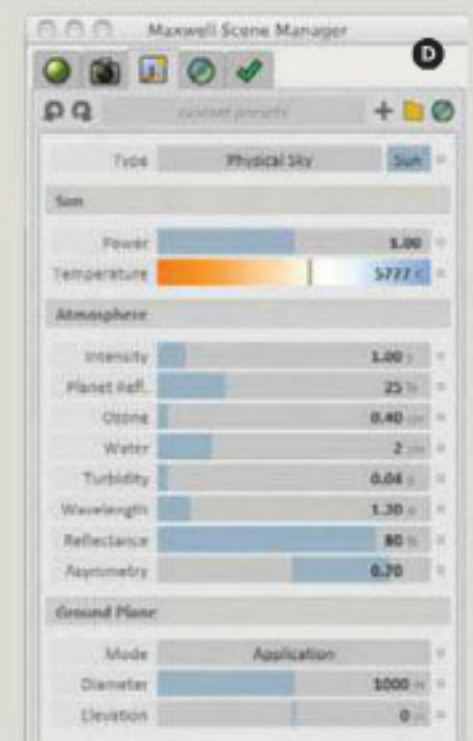
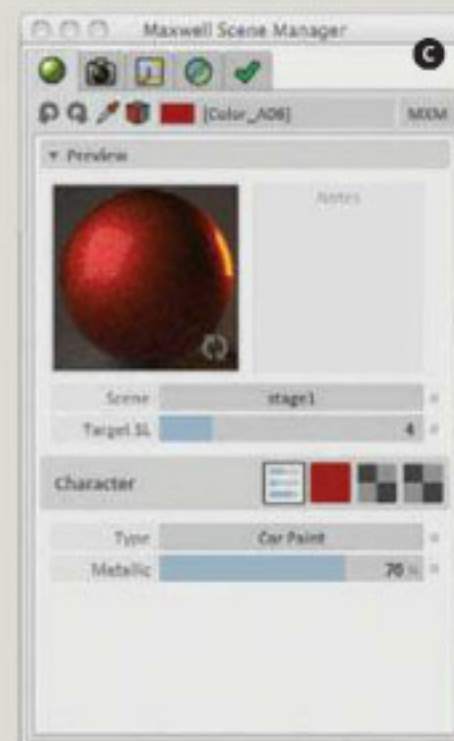
Ground Plane (Application mode will suffice). Now change the lighting type to Physical Sky and enable the Sun tickbox, this will present a series of new parameters for modification and drastically improve the rendered preview, adding shadows and improving lighting quality **D**.

05 HDRI lighting

High Dynamic Range Imagery (HDRI) can drastically improve the perceived realism of renders and can be seen in use in all manner of professional applications. To detail the intricacies of how image-based lighting works is unfortunately beyond the scope of this tutorial, although it is well worth researching. We have used the Meadow Trail 03 HDR image (kindly supplied for free online by www.hdrmill.com) by selecting Image Based in the Maxwell Environment Type dialog box and selecting the downloaded file as the Background channel. Alter the Intensity values if your rendered preview appears too dark. Enable Screen Map and your render should now improve dramatically over Step 4 **E**.

06 Maxwell resources

The Maxwell community is a fantastic resource, offering countless brilliant materials, HDRIs and skies for free to registered users. To reach the Maxwell Resources page, simply click the Browse MXM Gallery button in the main toolbar and experiment with some of the materials by clicking Load MXM File button once each file has been downloaded. MXM files are universally accessible across all Maxwell versions, so most materials have been created with great detail and precision using the Maxwell Studio edition **F**.



Masterclass

Jahirul Amin brings us the second part of a thorough step-by-step guide showing how to create a control rig in Maya. This issue we cover the hands, legs and feet



With the Disc

- The .ma scene files
- A create_controls.py script file
- Two walkthrough videos

Create a control rig: part 2

“Jahirul helps us complete our control rig in Maya”



The tutorial this issue is the second instalment showing how to create a control rig in Maya.

In issue 45 we covered the torso, neck, head and arms, so this month we are left with the hands, fingers, legs and feet.

Much of what we look at this issue will be a clear continuation of the last chapter. However, before we begin looking at the process, there are a couple of points that are worth making. First, you'll see that in Step 3 I use a Python script. I spent a long time avoiding using scripting; coming from more of an arty than a technical background, it doesn't come naturally to me. However, I found myself doing the same old steps again and again, which got a little dull, so I came around to learning some Python and Mel as a means of saving me some time and energy. Processes such as creating multiple controls, which would originally have taken an hour, can be

completed in minutes with a few lines of code. I now use scripting all the time and wouldn't be without it.

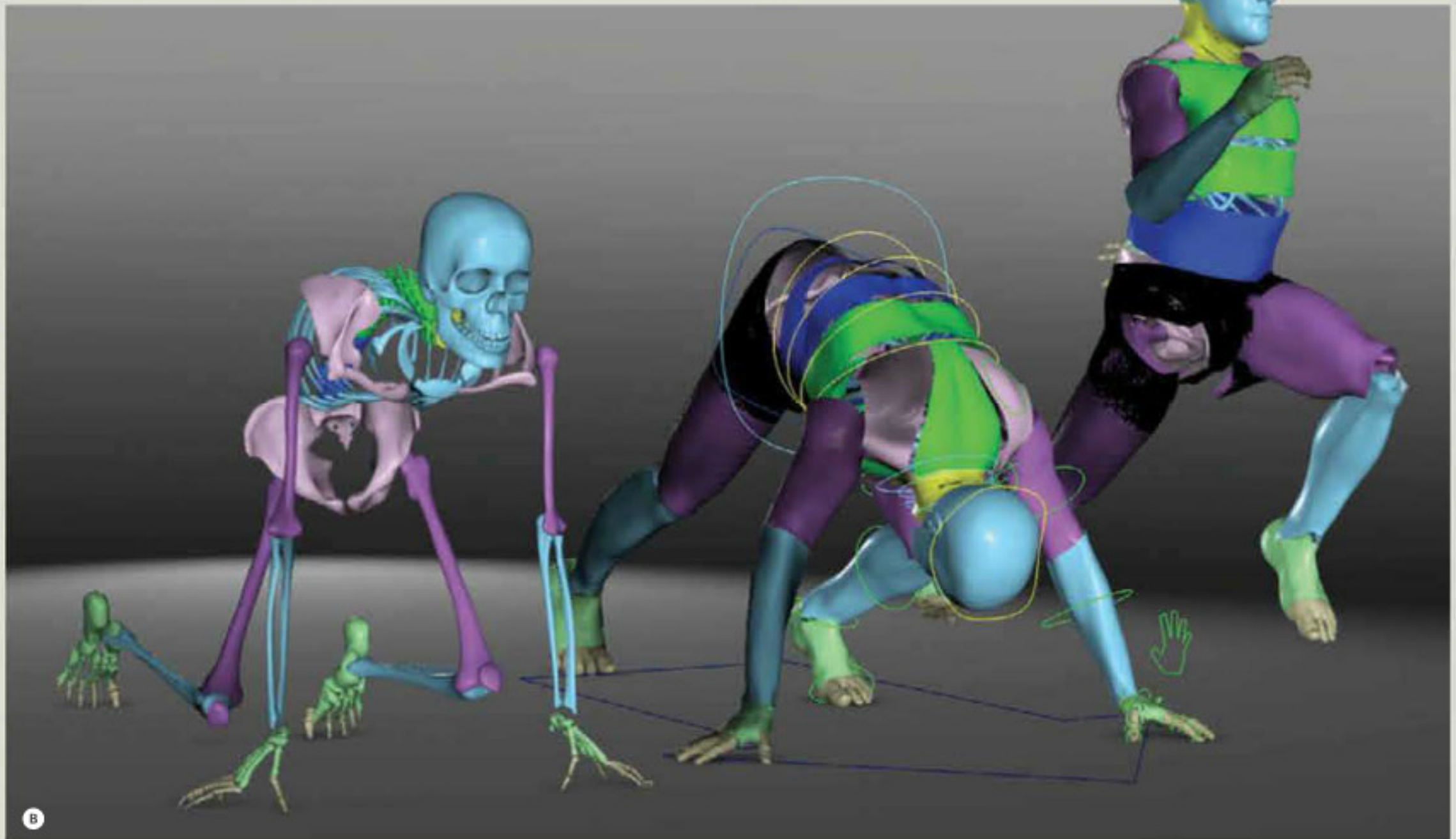
Second, when we come to the Reverse Foot setup, we will be looking in some detail at how the foot articulates, and identifying which points of the foot act as the pivots for these articulations. I cannot stress enough the importance of analysing real-life movement before attempting to replicate it in CG. As a lecturer in 3D animation, one of the most common areas I find for improvement in students' work is their gathering and analysis of reference material. Reference is king.

Moving on to the process, we'll begin by focusing on the hand and fingers. We'll be creating controls for each digit, providing the animator with the ability to have full control over how the finger is sculpted into each pose. Each finger will have four controls, giving the animator a great deal of

freedom in his/her choice of articulation.

However, animating in this way is obviously time-consuming, so we will also create a single additional control that will house custom attributes such as finger curl and spread. This additional control enables the animator to pose the hands much quicker and more efficiently.

When looking at the legs, we'll be using the same techniques as we used for the arms: creating a three-chain setup that will enable us to produce FK/IK blending. Once again, the reason for doing this is to grant the animator maximum freedom of choice. The legs in IK mode enable the animator to keep the feet planted, which is crucial for movements such as walking and running, while legs in FK mode can be made to jump and kick a ball, for example. Some animators, however, have a preference for working in either FK or IK, so as we have mentioned in previous tutorials, find out

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exactly what your animator needs before you set to work.

Similarly, when it comes to rigging the foot, we will be creating multiple locators to act as pivot points, each of which can be animated separately through custom attributes. On top of this we'll create a Foot Roll attribute, which will enable the

A The final control rig in pose

B A quick breakdown of the skeletal pose and the control rig that will be finished in this thorough tutorial

animator to create the complete roll, from placing the heel on the ground to the toes, leaving the ground in a single move. As well as obviously saving time while animating, the use of this attribute will also mean there is one rather than multiple curves on the Graph Editor, making the cleaning-up process simpler.

Once you reach Step 15 of this Masterclass, you'll have yourselves the left-hand side of a control rig. You'll see in the final scene file, however, that I have taken some additional time to tidy the rig up and finalise it to be passed into the animator's hands. I first went through the controls, then locked and hid any attributes that I did not want the animator to key, thereby protecting the rig and also making it clear for the animator which control does

what. For example, for all the FK controls only the Rotate channels can be keyed. I then used a Reverse node to edit the visibility of the FK/IK controls, enabling the animator to automatically know which mode they are working in. Next we add the possibility for the IK knee and IK elbow controls to follow the foot and the wrist controls respectively. Last, we'll create a global control to translate and rotate the character in its starting position.

So, once you have repeated the same steps for the right-hand side, you will have a complete control rig fully ready for animation. Of course, depending on your needs, things can always be taken further, for example to add stretchy, bendy limbs or adding roll bones for forearm twists. The sky is the limit, so happy rigging!

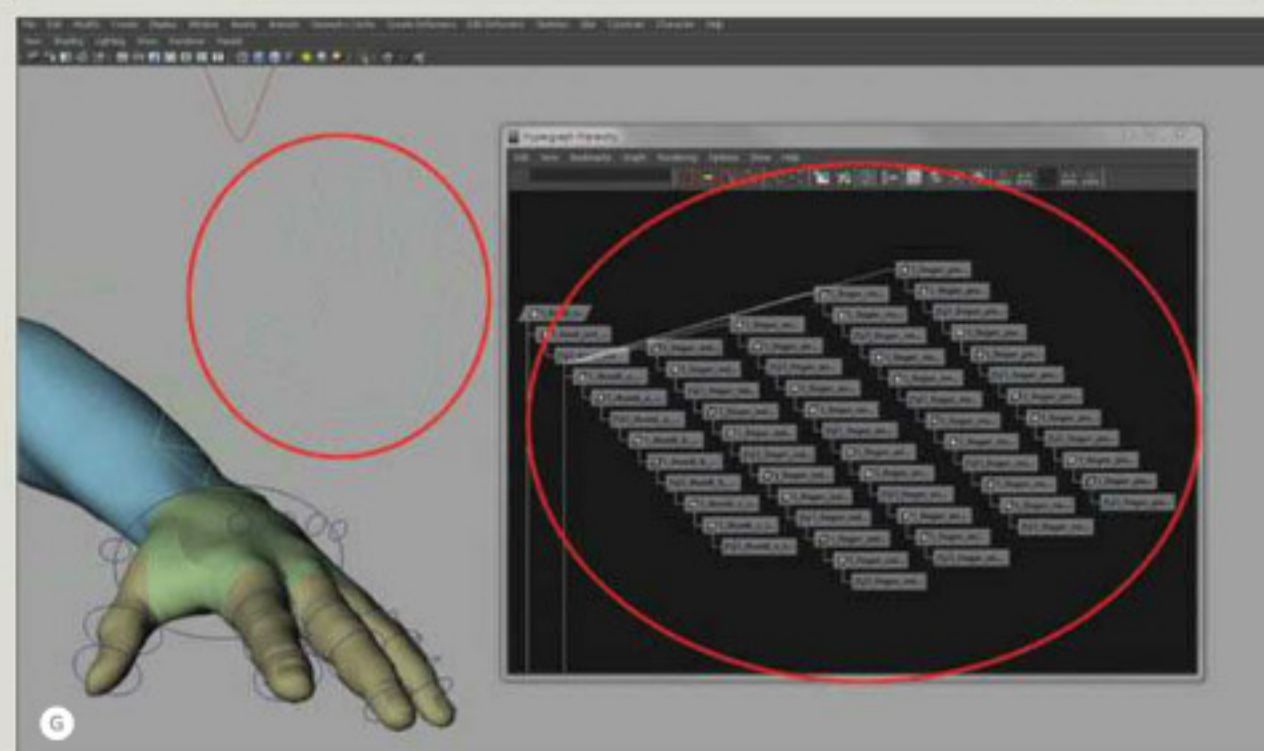
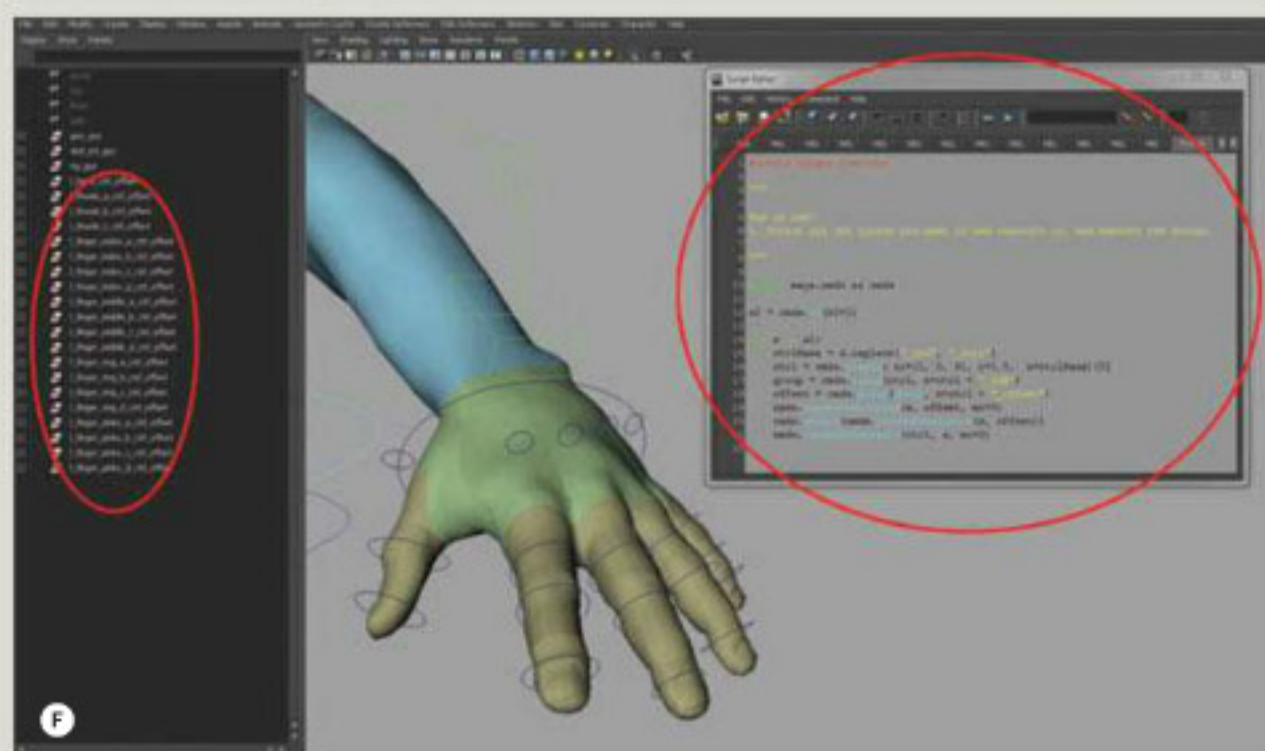
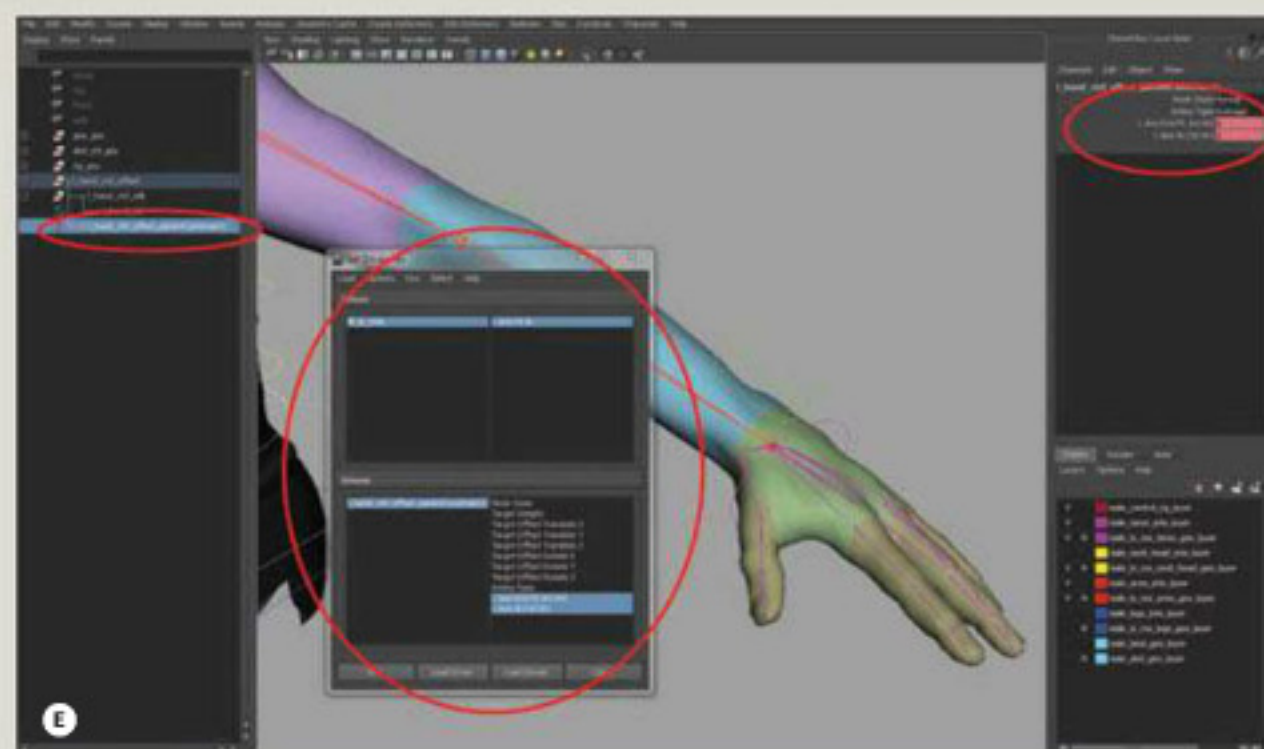
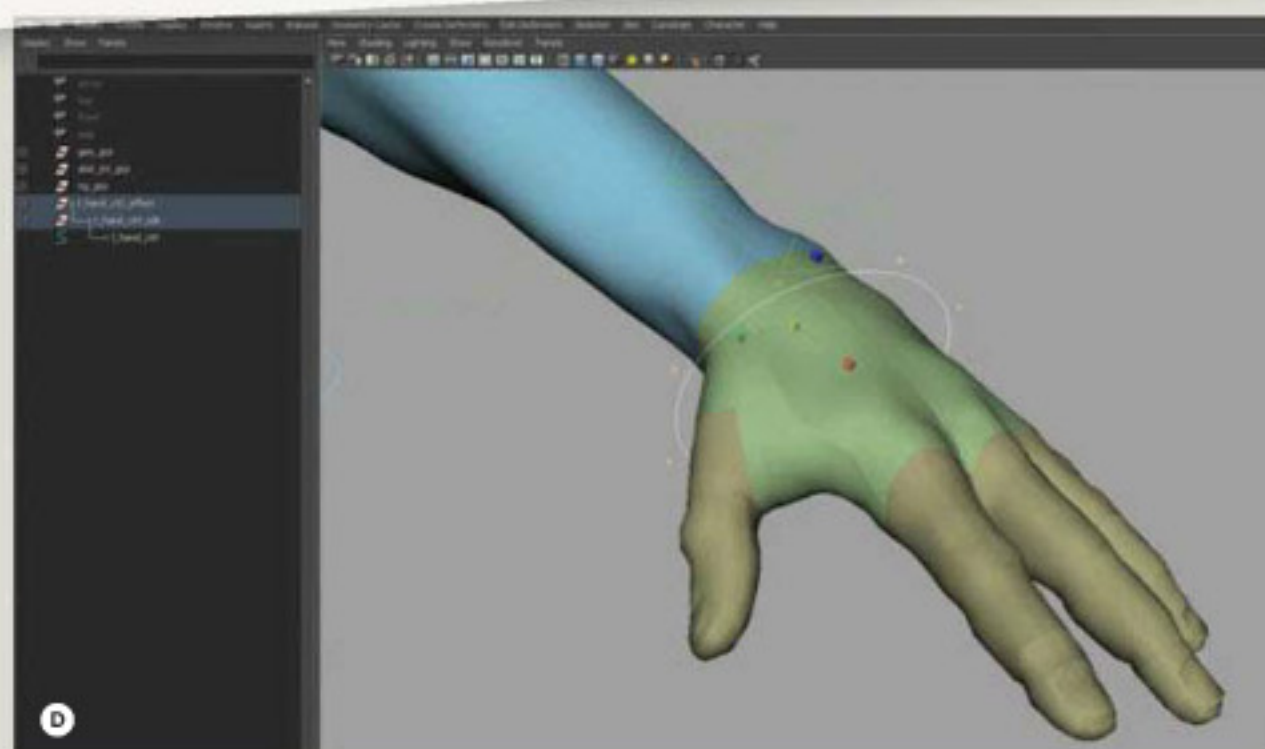


Constantly test your rig to its limits

Throughout the whole process it is important to test your rigs. Either do this yourself or pass it on to an animator. Push the rig as far as possible to see how durable it is. This may also reveal any problems that may have slipped through the net, such as flipping bones or maybe the FK/IK joints do not line up at the default pose. This is not the stuff you want to find out after you have finished weight painting. The quicker you find the problems and solve them, the better.

C An image to illustrate the key movements of the foot that will be focused on





+ Let's get hands-on

01 Create the hand control

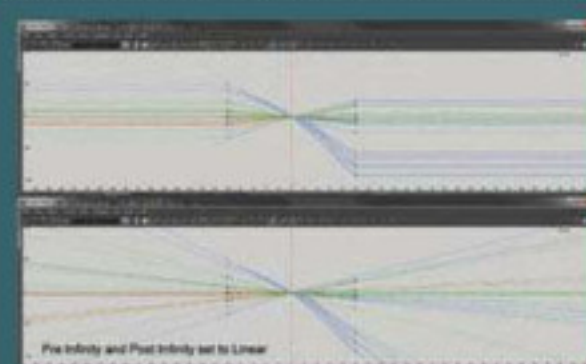
Begin by creating a NURBS circle (make sure Interactive Creation is unchecked) and rename it 'l_hand_ctrl'. With the control selected, hit Cmd/Ctrl+G twice to create the control hierarchy. Rename the uppermost group 'l_hand_ctrl_offset' and the next group down 'l_hand_ctrl_sdk'. Parent the Offset node under 'l_hand_jnt' and zero out the values in the Translate and Rotate channels. Unparent the Offset node so the control is a child of the world once more. Hit F9 to edit the control in Component mode to make it easier to select. Select l_hand_ctrl, Cmd/Ctrl-click l_hand_jnt in the Outliner and go to Constrain>Parent **D**.

02 Constrain the hand

Select in this order: l_arm_end_fk_jnt, l_arm_ik_ctrl followed by l_hand_ctrl_offset and go to Constrain>Parent. We now need to control the weighting of the constraint so the hand follows the FK or the IK chain in the correct mode. Go to Animate>Set Driven Key>Set to open up the SDK window. Select the fk_ik_ctrls and hit Load Driver. Select l_hand_ctrl_offset_

Removing limits on custom attributes

Last month I mentioned how I like to let animators push rigs without limits imposed by controls. Currently on some of our controls, for example the l_fingers_ctrl, there are limits. To remove the limits, highlight all the attributes for the control in the Channel box and go to Modify>Edit Attribute. Here you can uncheck Has Minimum and Has Maximum to get rid of the limits. We now need to edit the animation curves created with the Set Driven Keys. Select all the finger_sdk controls and open up the Graph Editor.



Go to View>Infinity, select the animation curves and go to Curves>Pre Infinity>Linear and Curves>Post Infinity>Linear.

parentConstraint1, which will be found under l_hand_ctrl_offset, and hit Load Driven. Set the L Arm FK IK to 0 on the fk_ik_ctrls control and set the L Arm End Fk Jnt W0 to 1 and L Arm Ik Ctrl W1 to 0 on the constraint. Highlight L Arm Fk Ik in the top-right box and L Arm End Jnt W0 and L Arm Ik Ctrl W1 in the bottom-right box of the SDK window and hit Key. Now set the L Arm Fk Ik to 1, reverse the values on the constraint and hit Key again **E**.

03 Set the finger controls

Open up create_controls.py in the Script Editor. Select all the finger joints (excluding the _end_jnt) and Execute the script. Once

done, all the controls should be created and the joints will also be orient constrained to their relevant controls. We will now need to go into Component mode to make the controls easily selectable **F**.

04 Arrange the hierarchy of the finger

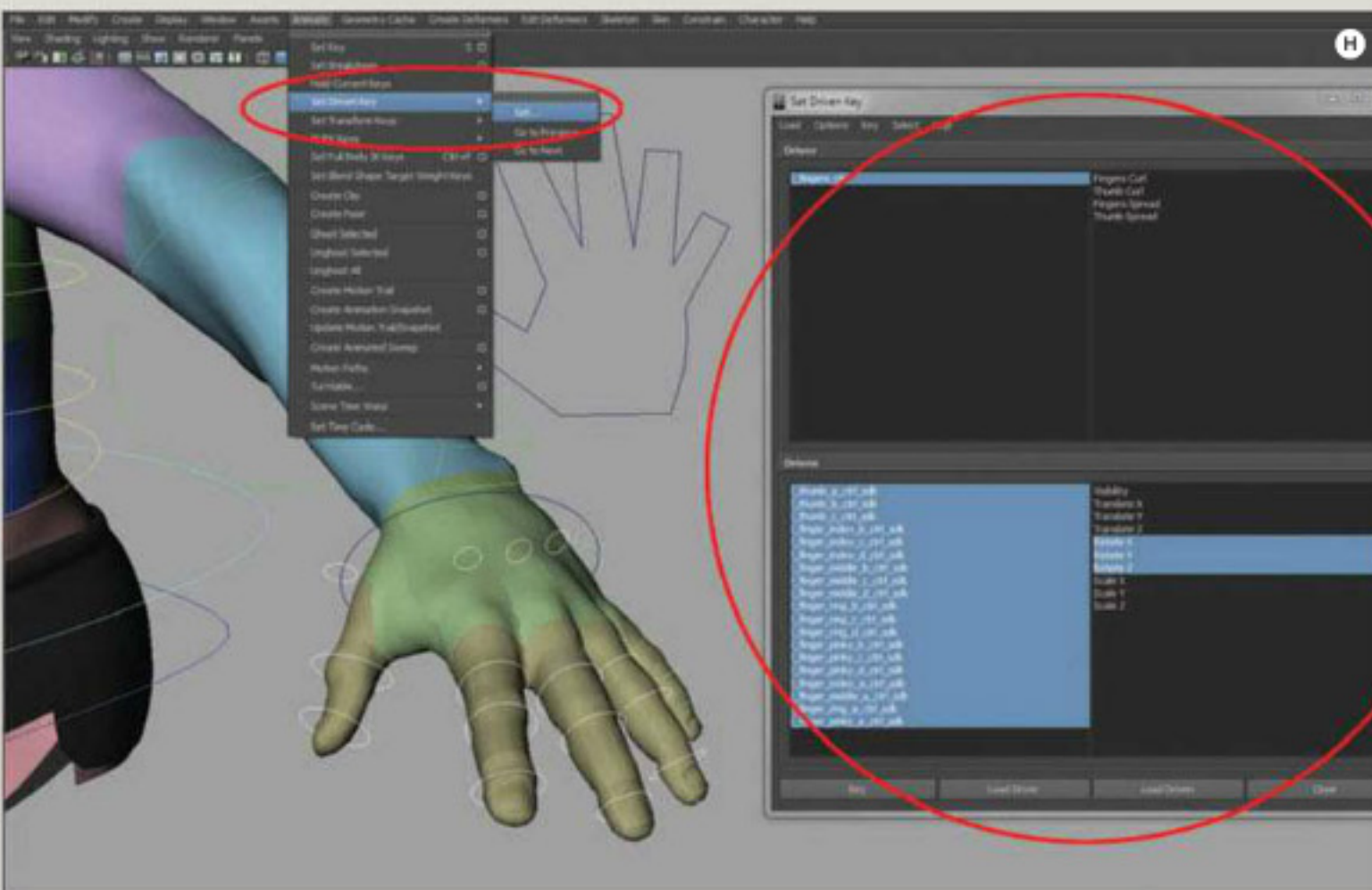
Parent l_finger_index_d_ctrl_offset under l_finger_index_c_ctrl. Parent l_finger_index_c_ctrl_offset under l_finger_index_b_ctrl. Parent l_finger_index_b_ctrl_offset under l_finger_index_a_ctrl. Do the same steps for the remainder of the fingers and the thumb. Once you have created the parent/child control hierarchy for all the

D The hand control in Component mode being reshaped to fit

E Using SDKs to set which mode drives the hand

F Using Python to speed up the control creation

G The control hierarchy for the fingers and the fingers' control in place



“To remove the limits, highlight all the attributes for the control in the Channel box and go to Modify>Edit Attribute”

fingers, select all the `_ctrl_offset` nodes and parent them under `I_hand_ctrl`. Select `I_hand_ctrl_offset` and hit Cmd/Ctrl+G. Rename that group '`I_hand_rig_grp`' and parent it under `rig_grp`. In the front view, go to Create>CV Curve Tool and draw a hand-like shape. Rename the created shape '`I_fingers_ctrl`' and go to Modify>Center Pivot. Position, rotate and scale the control so it is close to the hand and then go to Modify>Freeze Transformations. Now parent it under the `I_hand_ctrl` **G**.

05 Use Set Driven Keys to rig the fingers

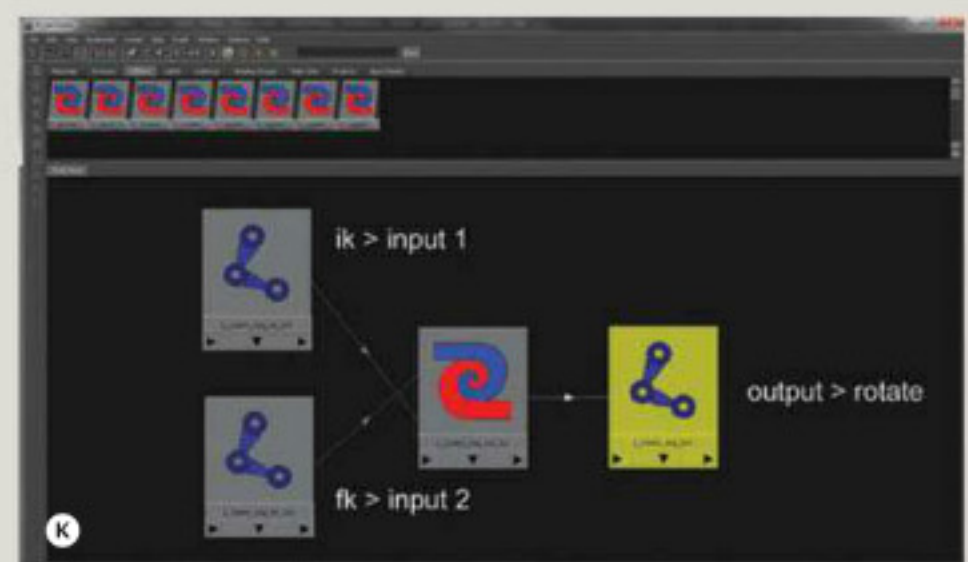
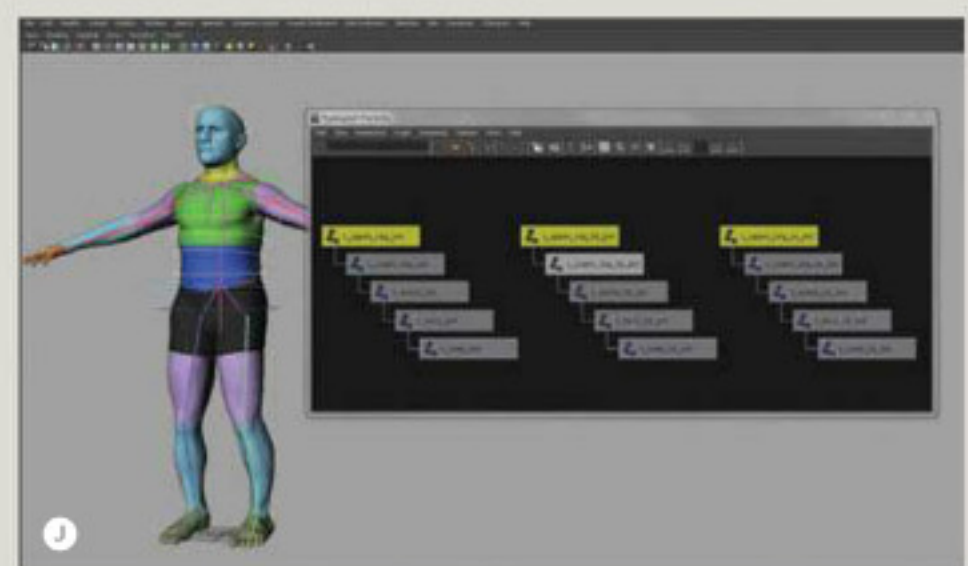
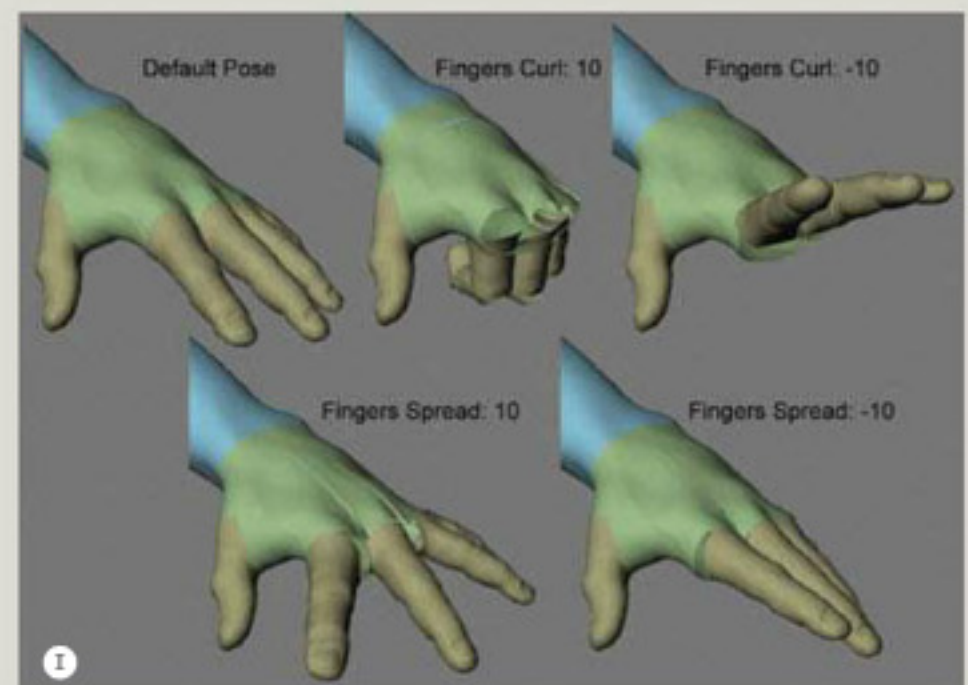
Select `I_fingers_ctrl` and lock and hide all the Translate, Rotate, Scale and Visibility attributes in the Channel box. Then go to Modify>Add Attribute and add the following with a Data Type of Float: a Minimum of -10, a Maximum of 10 and a Default of 0: `fingers_curl`, `thumb_curl`, `fingers_spread` and `thumb_spread`. There are plenty more attributes we can add as well as partitioning off each finger but for now we'll stick with these. Select all the finger controls' `_sdk` nodes and go to Animate>Set Driven Key>Set so that it loads them as the driven objects. Select `I_fingers_ctrl` and Load Driver in the SDK window. Make sure the Finger Curl attribute is set to 0 on the `I_fingers_ctrl`. Highlight all the `_sdk` controls on the bottom-left of the SDK window and also highlight all three Rotate channels in the bottom-right of the window. Last, hit Key on the SDK window **H**.

06 Complete the finger-rigging process

Next set the Finger Curl attribute to 10 and rotate the `_sdk` nodes in the Z-axis to form a fist. When you are happy with the shape you have created, hit Key again on the SDK window. Now set the Finger Curl attribute to -10 and rotate just the `_b_ctrl_sdk` nodes of all the fingers to 50 in the Rotate Z channel. Hit Key again in the SDK window. Put the fingers back in their default pose and highlight Fingers Spread in the top-right of the SDK window, highlight all the `_a_ctrl_sdk` and `_b_ctrl_sdk` nodes only and hit Key. Set the value of the Fingers Spread to 10 and fan out the fingers using the Rotate Y on the `_a_ctrl_sdk` and `_b_ctrl_sdk` nodes and hit Key when you are happy with the pose. Now set the Fingers Spread to -10, bring the fingers in together using the rotate Y on the `_sdk` nodes and hit Key when you are happy with the pose. Repeat these steps for the thumb and add any extra attributes that you wish **I**.

07 FK/IK legs A

Duplicate `I_upper_leg_jnt` and use Modify>Search and Replace Names to search for '`_jnt`' and replace with '`_fk_jnt`'. Duplicate the `I_upper_leg_jnt` again and rename it to end with '`_ik_jnt`'. You should now have two extra leg chains that will drive the original chain. Go to Window>Rendering Editors>Hypershade and create a Blend Colors utility node. Rename the node '`I_upper_leg_rot_bc`'. Select `I_upper_leg_jnt`,



H Use Set Driven Keys to drive the custom controls for the fingers

I The custom attributes on the finger control used to quickly and easily pose the hand

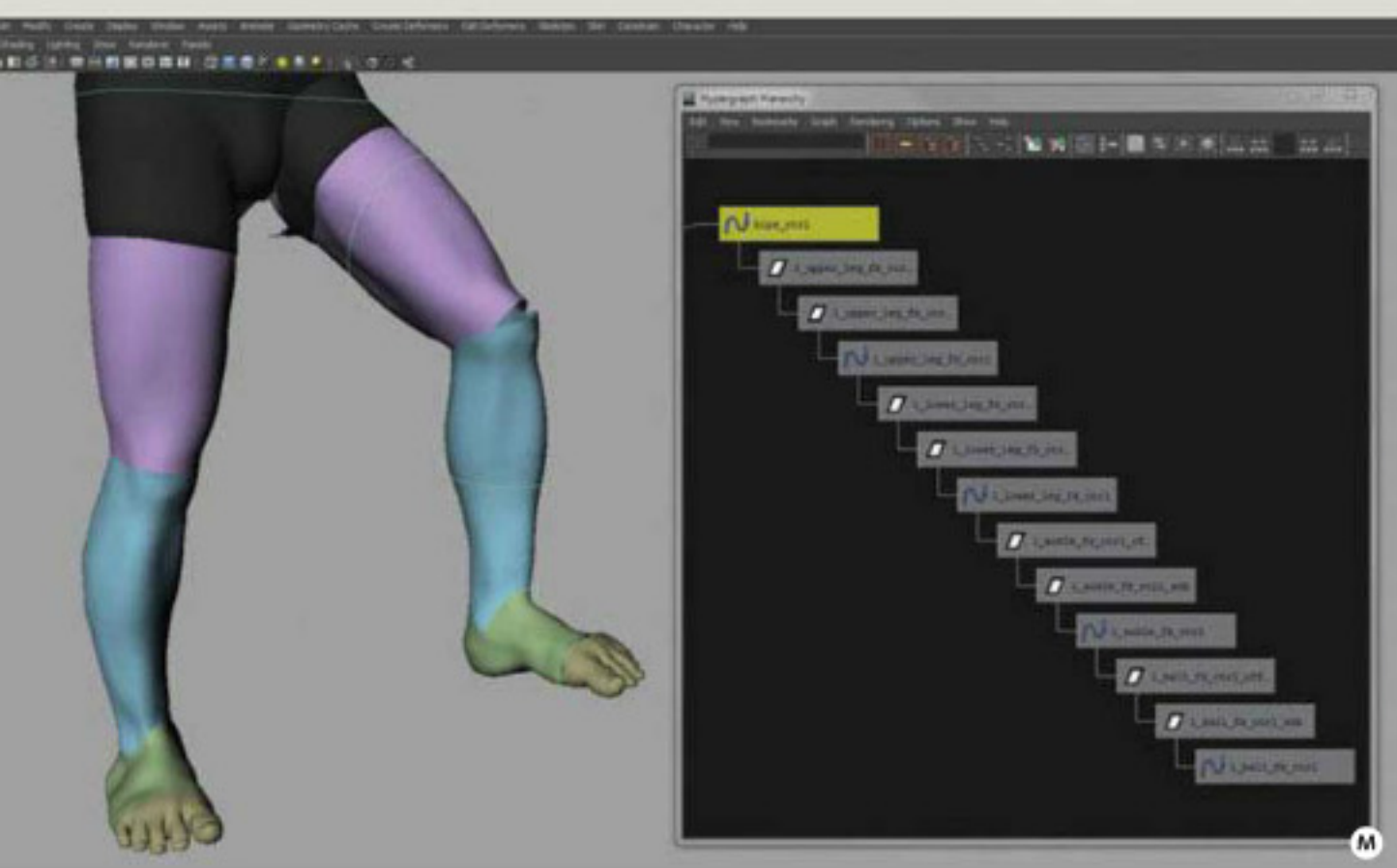
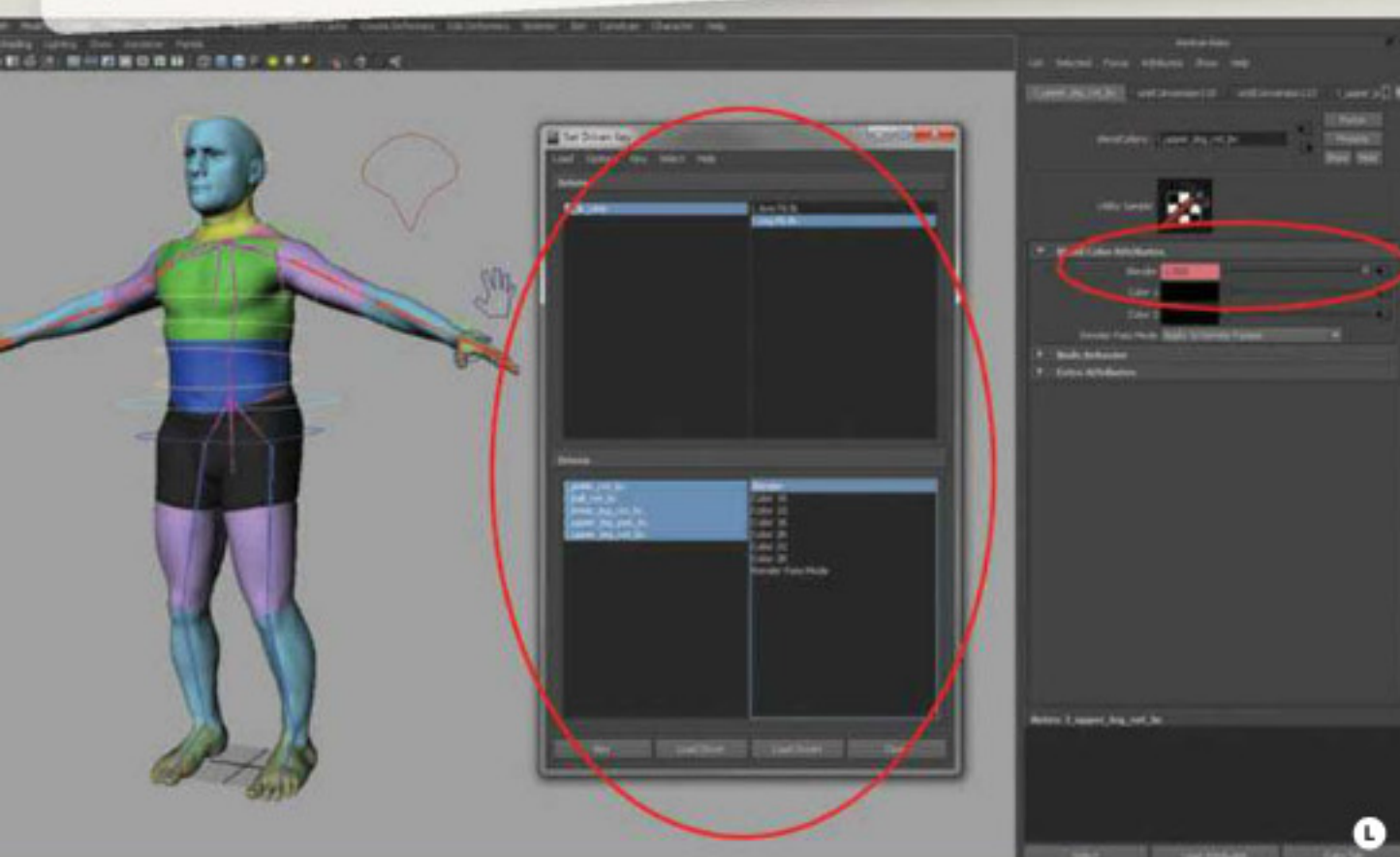
J The duplicated joint chains used for both the FK and IK blending

K Using the Blend Colors node to drive the rotation of the main joint chain

`I_upper_leg_fk_jnt`, `I_upper_leg_ik_jnt` and in the Hypershade window go to Graph>Add Selected to Graph so they come into the Work Area. Connect the output rotate>rotate from the `I_upper_leg_ik_jnt` into the color1 input of the `I_upper_leg_rot_bc`. Connect the output rotate>rotate from the `I_upper_leg_fk_jnt` into the color2 input of the `I_upper_leg_rot_bc`. Then connect the output>output of the `I_upper_leg_rot_bc` into the input rotate of the `I_upper_leg_jnt` **J**.

08 FK/IK legs B

Create another Blend Colors node and rename it '`I_lower_leg_rot_bc`'. Bring `I_lower_leg_jnt`, `I_lower_leg_fk_jnt`, `I_lower_leg_ik_jnt` into the Hypershade and do the connections again. Make sure to connect the rotate of `_ik_jnt` into input 1 of the Blend Colors node and the `_fk_jnt` into the input 2. Also create a Blend Colors node for the rotation of the `I_ankle_jnt` and `I_ball_jnt`.



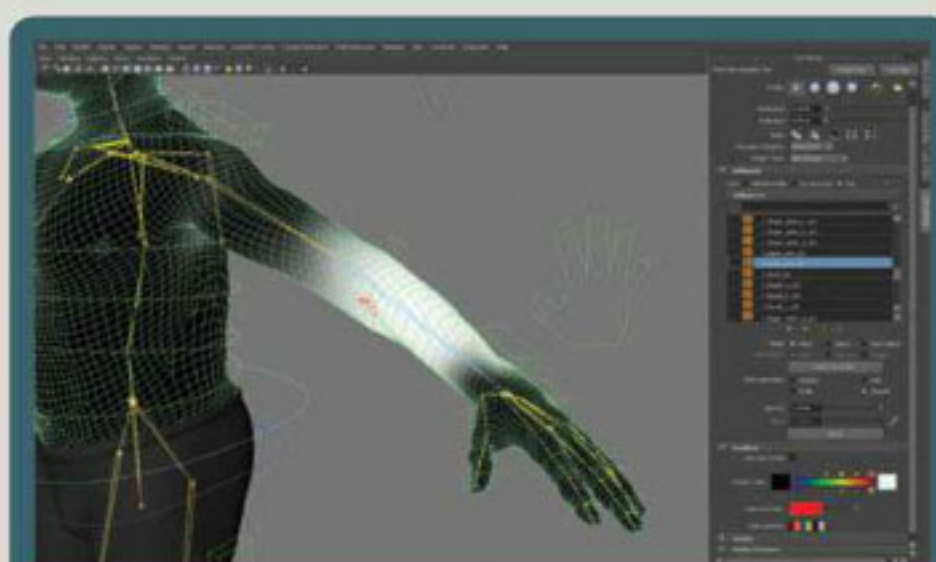
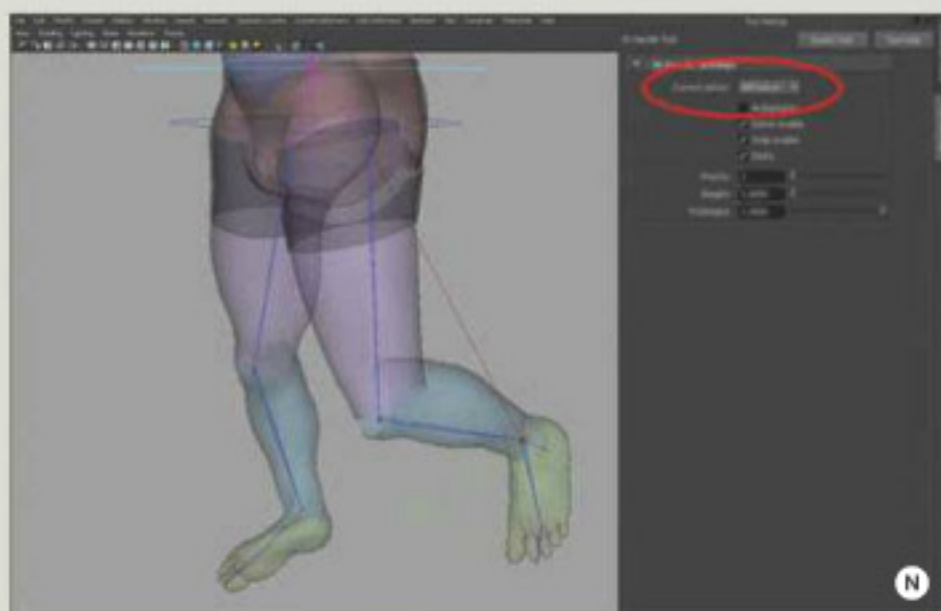
Create one more Blend Colors node and again load the `l_upper_leg_jnt`, `l_upper_leg_fk_jnt`, `l_upper_leg_ik_jnt` into the work area. Rename the Blend Colors node '`l_upper_leg_pos_bc`'. This time connect the `translate>translate` of the IK and FK joints into input 1 and 2 of the `l_upper_leg_pos_bc` and plug the `output>output` from the Blend Color node into the input `Translate` of the `l_upper_leg_jnt` .

09 FK/IK Switch

Select `fk_ik_ctrls` and go to **Modify>Add Attribute**. Call it: `l_leg_fk_ik` and make it a Float with a Minimum of 0 and a Maximum of 1. Select all five Blend Color nodes that we just created and go **Animate>Set Driven Key>Key**. Select the `fk_ik_ctrls` and click **Load Driver**. Set the `l_leg_fk_ik` attribute to 0, set all the Blend Colors Blender attributes to 0 and hit **Key** in the SDK window. To complete the switch, set the `l_leg_fk_ik` attribute to 1, all the Blender attributes to 1 and hit **Key** .

10 FK leg controls

Set the `l_leg_fk_ik` attribute to 0 so we are in FK mode and then select `l_upper_leg_fk_jnt`, `l_lower_leg_fk_jnt`, `l_ankle_fk_jnt` and `l_ball_fk_jnt`. Open up the Script Editor and load the `create_controls.py` script once more. With the joints still selected, execute the script to create the controls. You will need to go into Component mode again to edit their shape to make them more easily



Moving on

Once you are happy with your control rig, the next stage would be to envelope the mesh to the joints. Do this by selecting all the joints (excluding all the `_end_jnt`) and the main geometry and going to Skin>Bind Skin>Smooth Bind. By default, the results will not be pretty and there will need to be a lot of cleaning up. The main tools I use at this stage are the Paint Skin Weight Tool and the Component Editor. Taking the time to get the best deformation from the mesh is crucial at this stage; anything that you cannot achieve can be corrected later with shape fixers.

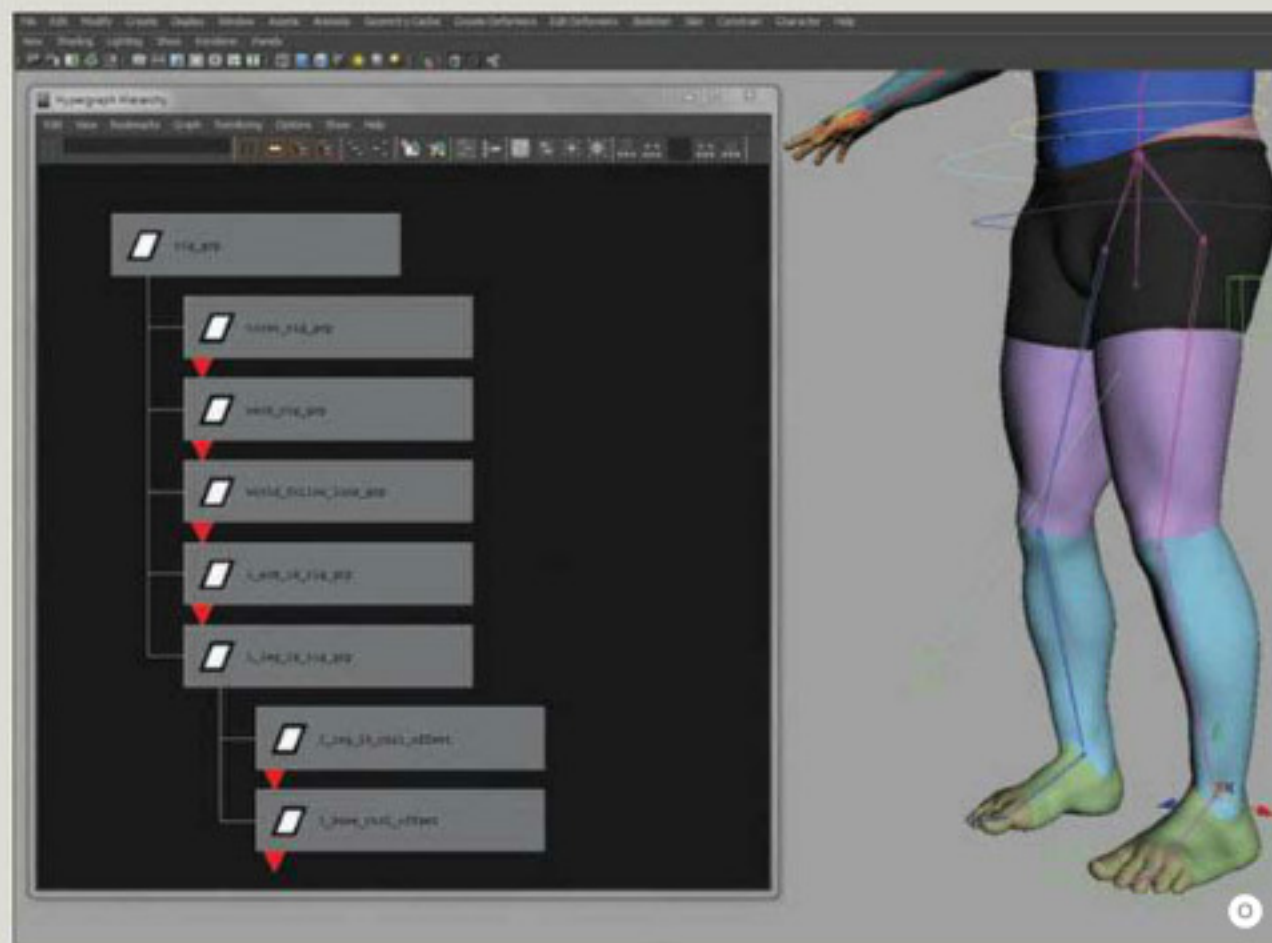
- L** Drive the Blend Color nodes using SDKs to set the legs' node
- M** The control hierarchy for the FK leg
- N** Making sure we are using the ikRPsolver for the leg
- O** Illustrated are the placements of the IK upper leg, knee and foot controls
- P** The placements of the locators used for the reverse foot
- Q** The hierarchy for the reverse foot position
- R** The expression used to set up the majority of controls for the reverse foot

11 IK leg controls A

Set the `_leg_fk_ik` attribute to 1 so we are in IK mode. Select `_upper_leg_jnt` and `_upper_leg_fk_jnt` and hit Cmd/Ctrl+H to hide them so we can focus on the IK leg chain. Go to Skeleton>IK Handle Tool (Options), set the Current Solver to `ikRPsolver` and create an IK handle from the `_upper_leg_ik_jnt` to the `_ankle_ik_jnt`. Rename the IK handle '`_leg_ik_handle`'. Create a control for the IK handle, as we have done for the rest of our controls. Call this control '`_leg_ik_ctrl`' and parent the Offset node of that control to `_leg_ik_handle` and zero out the Translate and Rotate values. Once it snaps into position, unparent the control. Parent `_leg_ik_handle` under `_leg_ik_ctrl`. Create another control and call it '`_upper_leg_ik_ctrl`'. Position it to the same place as the `_upper_leg_ik_jnt` using the Offset node .

12 IK leg controls B

Point constrain `l_upper_leg_ik_jnt` to `l_upper_leg_ik_ctrl`. Parent `l_upper_leg_ik_ctrl_offset` under `hips_ctrl`. Create another control that will be for our knee. Call this control '`l_knee_ik_ctrl`'. Select (in this order) `l_upper_leg_ik_jnt`, `l_lower_leg_ik_jnt`, `l_ankle_ik_jnt` and then `l_knee_ik_ctrl_offset`. Go to **Constrain>Point (Options)**.



make sure Maintain Offset is unchecked and hit Add. It should snap in between the leg chain. Next, select the `l_lower_leg_ik_jnt` and then `l_knee_ik_ctrl_offset` and go to **Constrain>Aim**. Now delete both constraints that are under the Offset node and, making sure that your move tool is set to Object mode under Move Axis, translate the Offset node forwards in the X-axis. Select `l_knee_ik_ctrl` and **Cmd/Ctrl-click** `l_leg_ik_handle` in the Outliner and go to **Constrain>Pole Vector**. Select `l_leg_ik_ctrl_offset` and `l_knee_ik_ctrl_offset` and hit **Cmd/Ctrl+G**. Call this group '`l_leg_ik_rig_grp`' and parent it under `rig_grp` **O**.

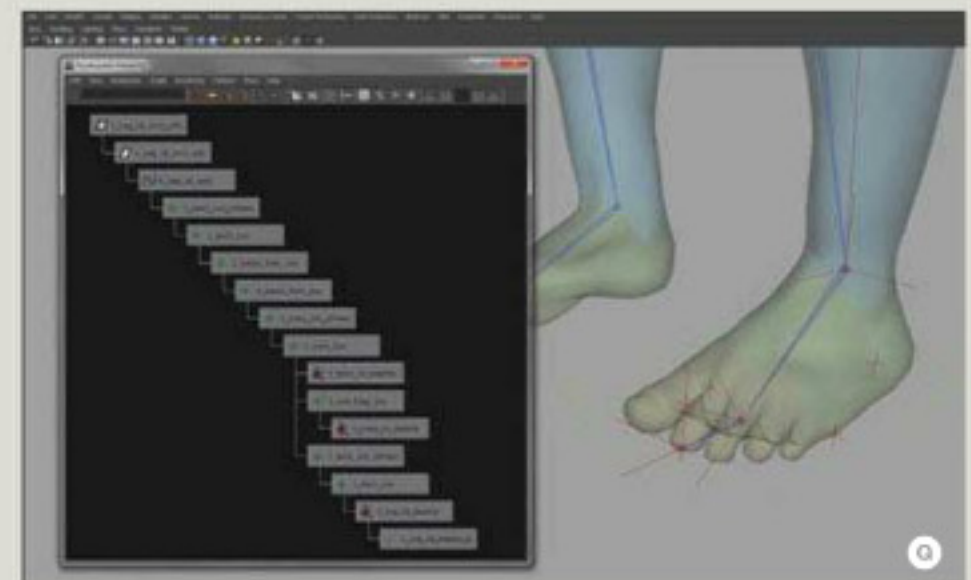
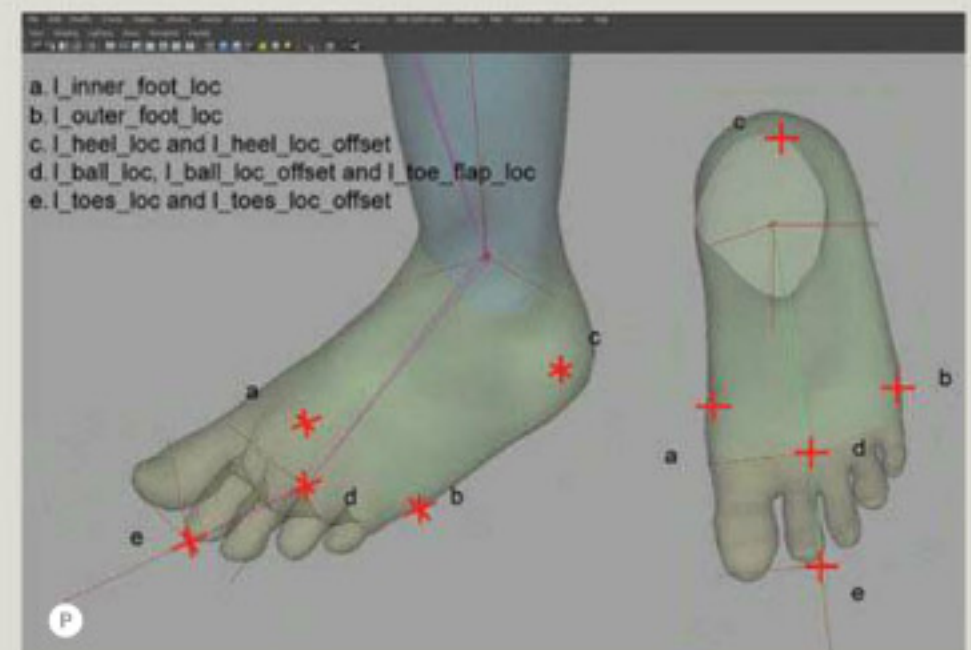
13 Reverse foot A

Go to **Skeleton>IK Handle Tool (Options)**, set the Current Solver to `ikSCsolver` and create an IK handle from the `l_ankle_ik_jnt` to the `l_ball_ik_jnt`. Rename this IK handle '`l_ball_ik_handle`'. Create another IK handle between `l_ball_ik_jnt` and `l_toes_ik_jnt` and

rename this handle '`l_toes_ik_handle`'. Now create nine locators by going to **Create>Locator** and rename them as follows: '`l_heel_loc`', '`l_heel_loc_offset`', '`l_outer_foot_loc`', '`l_inner_foot_loc`', '`l_toes_loc`', '`l_toes_loc_offset`', '`l_ball_loc`', '`l_ball_loc_offset`' and '`toe_flap_loc`'. Position `l_ball_loc`, `l_ball_loc_offset` and `toe_flap_loc` at the `l_ball_ik_jnt` using point snapping. Point snap `l_toes_loc` and `l_toes_loc_offset` to the same position as `l_toes_ik_jnt`. Position `l_heel_loc` and `l_heel_loc_offset` at the heel of the foot geometry. Then finally position `l_outer_foot_loc` and `l_inner_foot_loc` at the widest sections of the outer and inner parts of the foot **P**.

14 Reverse foot B

Now we need to create the reverse foot hierarchy. Parent `l_ball_ik_handle` under `l_toes_loc`. Parent `l_toe_ik` under `l_toe_flap_loc`. Parent `l_leg_ik_handle` under `l_ball_loc`. Parent `l_ball_loc` under `l_ball_loc_offset`.



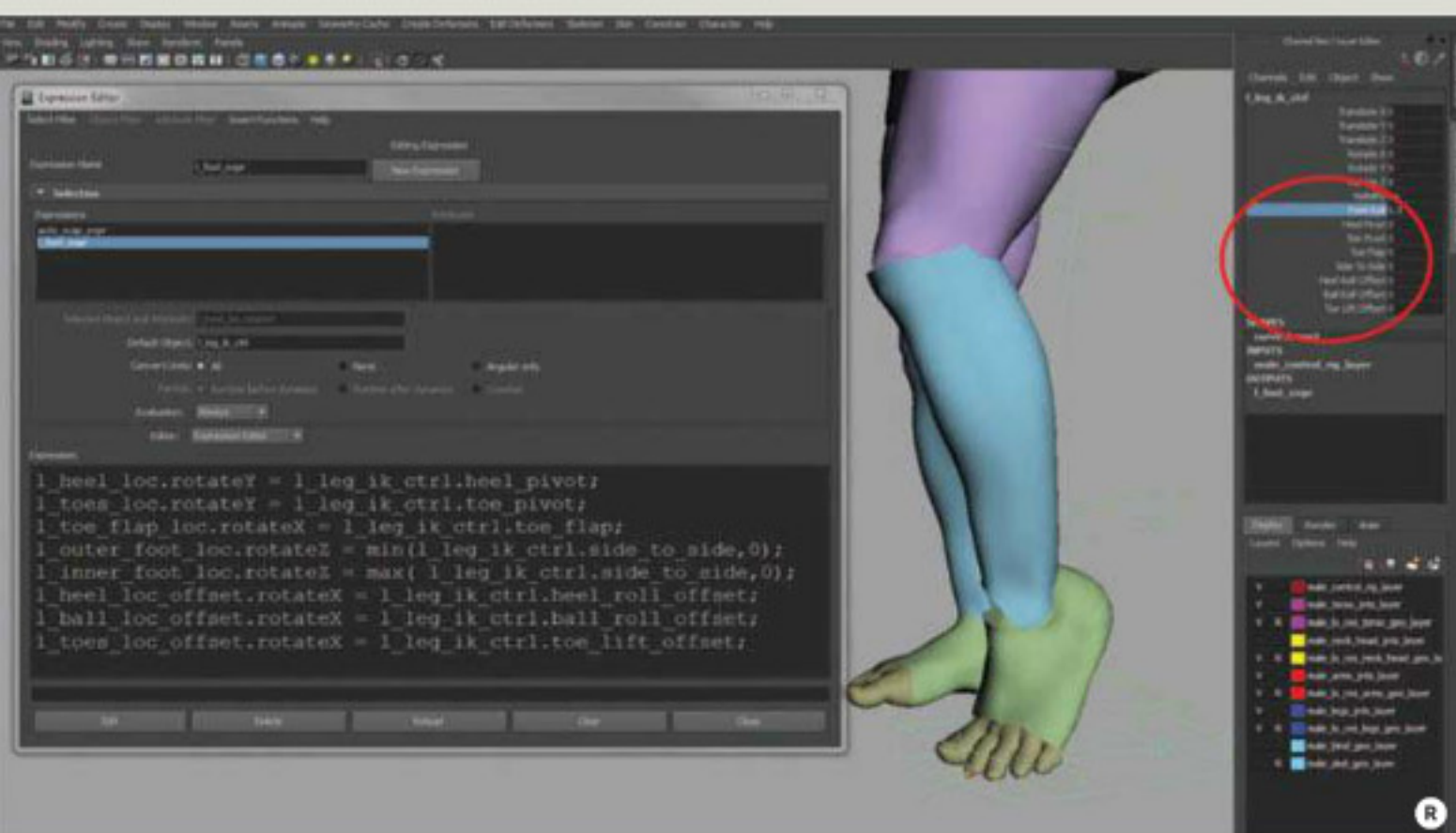
offset. Parent both `l_ball_loc_offset` and `l_toe_flap_loc` under `l_toes_loc`. Parent `l_toes_loc` under `l_toes_loc_offset`. Parent `l_toes_loc_offset` under `l_inner_foot_loc`. Then parent `l_inner_foot_loc` under `l_outer_foot_loc`. Next parent `l_outer_foot_loc` under `l_heel_loc` and `l_heel_loc` under `l_heel_loc_offset`. Finally parent `l_heel_loc_offset` under `l_leg_ik_ctrl`. Select `l_leg_ik_ctrl` and add the following attributes with a Data Type of Float (leave the Minimum, Maximum and Default options empty for now): '`foot_roll`', '`heel_pivot`', '`toe_pivot`', '`toe_flap`', '`side_to_side`', '`heel_roll_offset`', '`ball_roll_offset`' and '`toe_lift_offset`' **O**.

15 Reverse foot C

Go to **Window>Animation Editors>Expression Editor** and create the following expression:

```
l_heel_loc.rotateY = l_leg_ik_ctrl.heel_pivot;
l_toes_loc.rotateY = l_leg_ik_ctrl.toe_pivot;
l_toe_flap_loc.rotateX = l_leg_ik_ctrl.toe_flap;
l_outer_foot_loc.rotateZ = min(l_leg_ik_ctrl.side_to_side,0);
l_inner_foot_loc.rotateZ = max(l_leg_ik_ctrl.side_to_side,0);
l_heel_loc_offset.rotateX = l_leg_ik_ctrl.heel_roll_offset;
l_ball_loc_offset.rotateX = l_leg_ik_ctrl.ball_roll_offset;
l_toes_loc_offset.rotateX = l_leg_ik_ctrl.toe_lift_offset;
```

Select `l_ball_loc`, `l_toes_loc`, `l_heel_loc` and go **Animate>Set Driven Key>Set** to open up the SDK window and bring them in as the driven objects. Select `l_leg_ik_ctrl` and click **Load Driver**. Highlight **Foot Roll** (make sure it's set to 0) in the top-right panel, highlight **Rotate X** in the bottom-right panel and click **Key**. Set the **Foot Roll** attribute to -10 and then set the **Rotate X** for the `l_heel_loc` to -50. Leave `l_ball_loc` and `l_toes_loc` with a **Rotate X** of 0. With all three driven objects highlighted, hit **Key**. Now set the **Foot Roll** attribute to 5 and set the **Rotate X** for `l_ball_loc` to 50. Leave `l_toes_loc` and `l_heel_loc` at 0 and hit **Key** again. Now set the **Foot Roll** to 10 and set the **Rotate X** for the `l_toes_loc` to 70 and 0 for `l_ball_loc` and `l_heel_loc`. Hit **Key** once more to finish **R**.



Back to basics

Learn how to clothe a character in Marvelous Designer using a quad-only pipeline

Create realistic cloth



Marvelous Designer, 3D-Coat

“Sebastian Zimmermann demonstrates how to use Marvelous Designer to create realistic cloth”

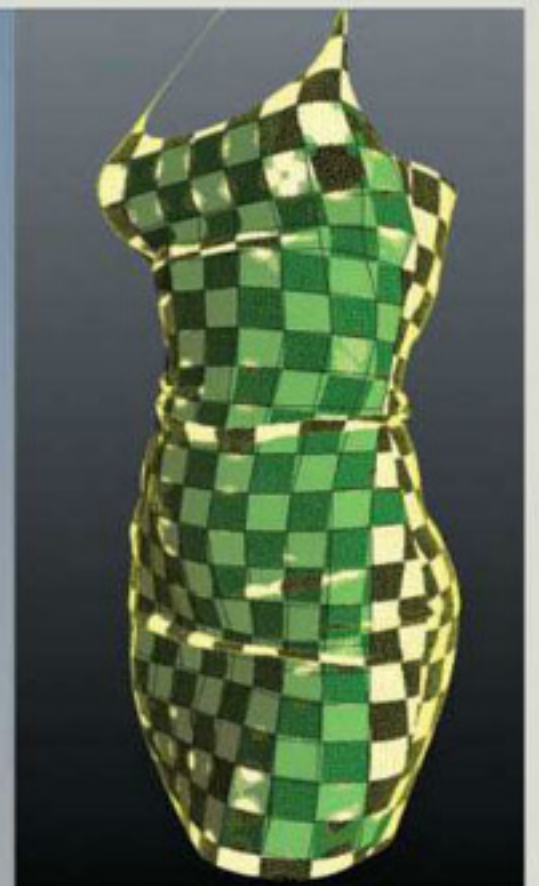
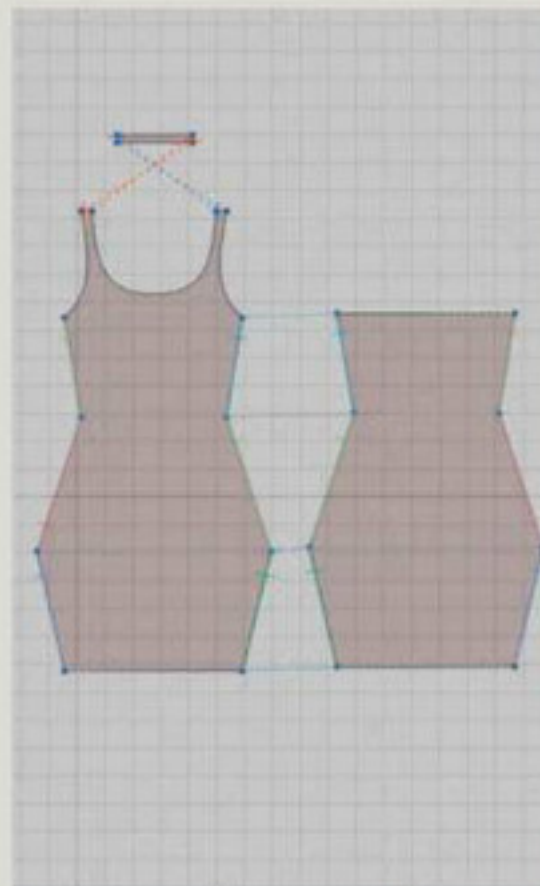
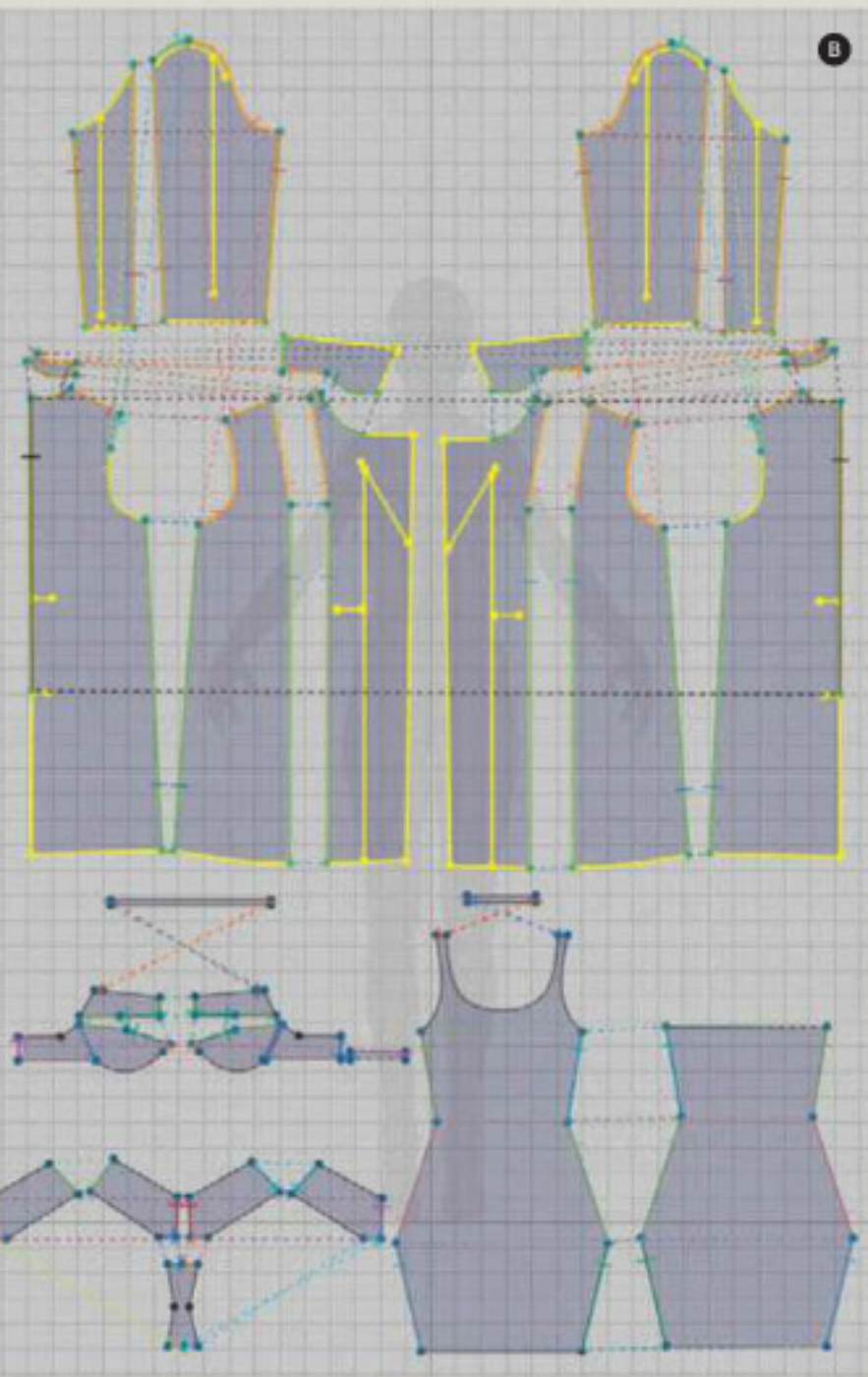


Building cloth for different characters has always been a struggle.

The complexity of cloth can't be ignored, and in the case of planning and resulting deadlines can be quite a problem. But even if we have got the time to work out every little detail, it can get frustrating when the folds just don't work.

The appearance of cloth is determined by the physical properties of the fabric, the gravity, other physical forces like wind, and the body under it. The human body is by far one of the most complex objects to re-create and fit to cloth. Understanding this, whatever tool helps to create or simulate the cloth is crucial to be able to

create realistic drapery. I still like to study and sculpt drapery myself without using simulation or any digital tools, and when attempting to sculpt cloth I always recommend making the body under it, or even better taking a copy of the body and adding the folds on top of it. This method helps to enhance the visual effect a lot and

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creates a more accurate imitation of how cloth really behaves.

While working on a game project we started to experiment with Marvelous Designer, a program that was originally intended for fashion designers. This tool surprised us with its user-friendly interface and natural capacity to design cloth for our characters. First you have to lay out the pattern for the garment. Before designing your own garment, it might be good practise to look up some professional patterns and try to rebuild them in Marvelous Designer. This procedure helps to create a basic understanding of how clothing is and isn't to be made. Designing patterns which result in good-looking garments is a craft by itself.

After the pattern is created, you have to define the sewing lines and arrange the pattern pieces around the body. Marvelous Designer can simulate the cloth on top of your avatar. The garment perfectly interacts with the body under it, depending on the physical properties you set. To breathe a bit more life into your scene you can also have the cloth react to a wind effect. If you have a well-shaped body under your garment and an accurate idea of what kind of material you want to simulate, it just takes some time to achieve a realistic costume.

For me, the next question was how to integrate the program into a quad-only

pipeline. Here I found 3D-Coat very useful as it enables you to create a clean topology on top of your reference mesh by snapping the vertex you set to the surface. One of the big advantages of this software is that you are still able to move the vertices on the surface. After the clean topology is created, I like to use the UV tools of 3D-Coat to add a UV map to the object. I've found that they are slightly faster and more convenient than the UV functions of 3ds Max, for example, when it comes to unwrapping organic objects. When we do add additional subdivisions to the retopology mesh, they will also be snapped to the surface of the reference mesh. This way we easily get all fine detail transferred to our clean topology.

With this new topology, I went back to my sculpting software and refined my

“The appearance of cloth is determined by the physical properties of the fabric, the gravity, other physical forces like wind and the body under it”

garment until I achieved a perfect surface. Since the garment straight out of Marvelous Designer has a very accurate UV in the shape of the pattern, I usually start to lay out my texture on the original mesh and transfer it later with a texture projection onto the final model. This is most useful when you want to have clean patterns covering your fabric.

Marvelous Designer offers much more functionality than what will be demonstrated in this tutorial, but I hope it will help you get started with your own projects. If you enjoy designing your own apparel and need further help, check out the helpful tutorials offered by the software creators and community of users on the Marvelous Designer website at www.marvelousdesigner.com.

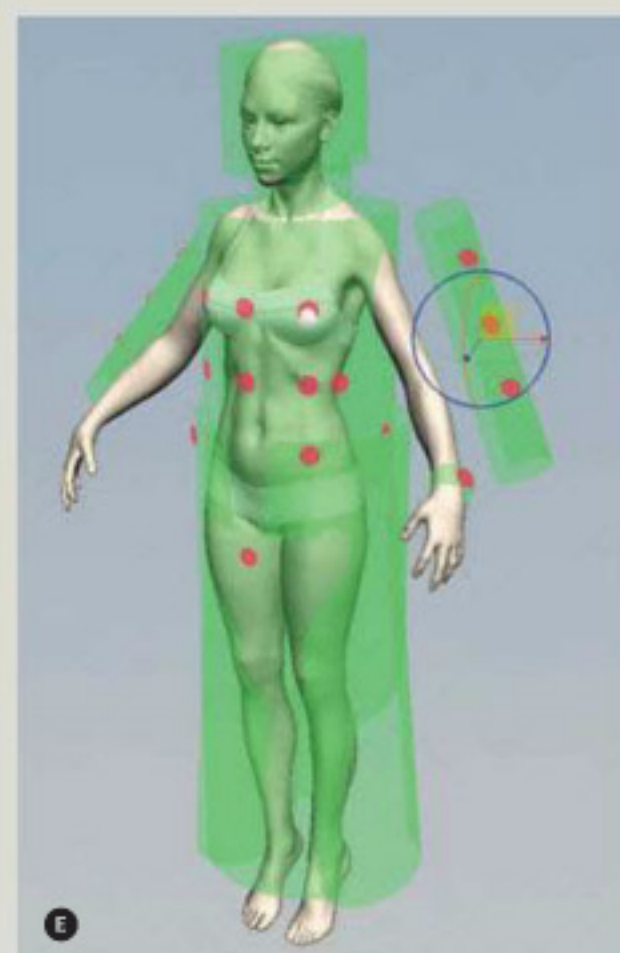
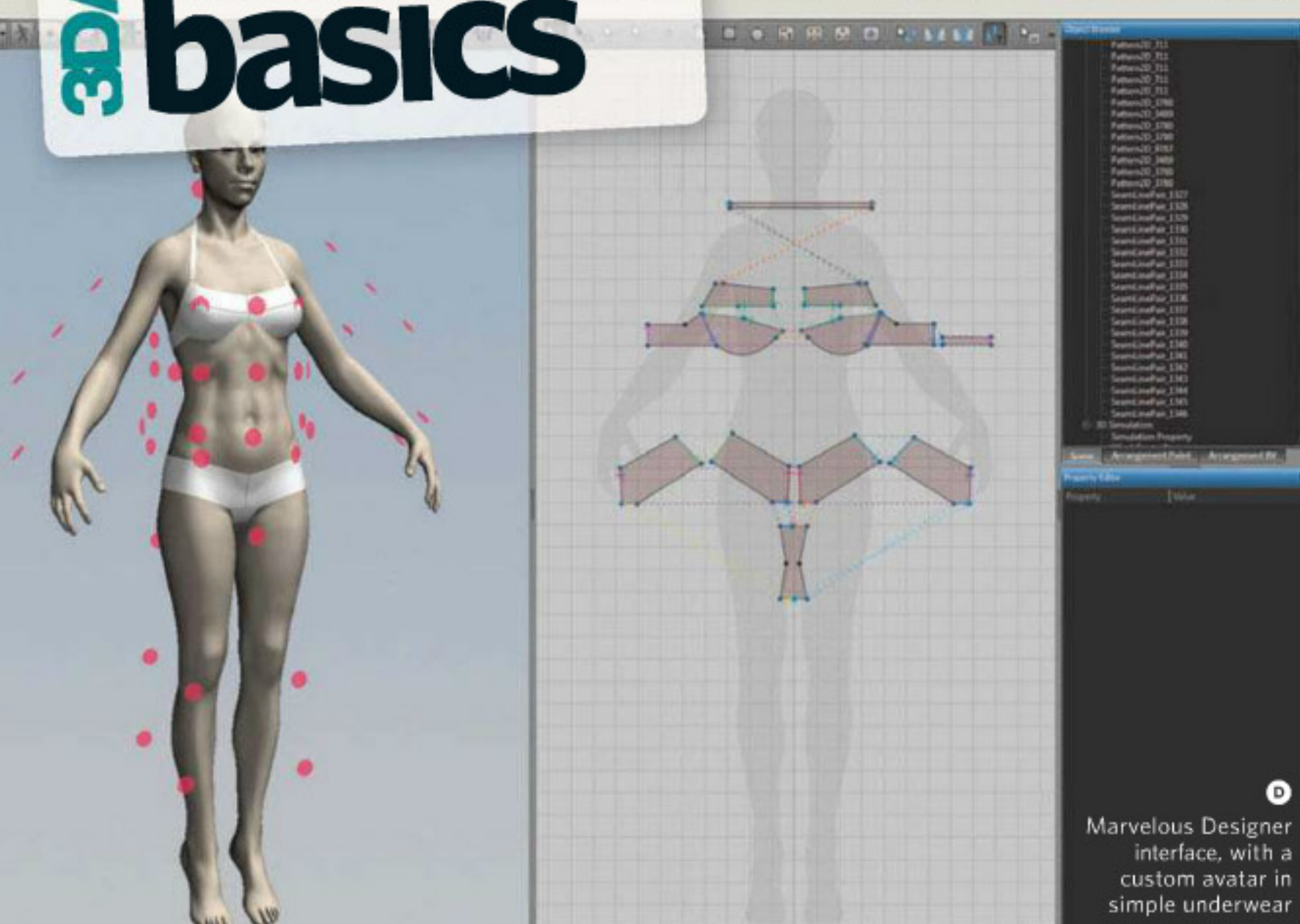
A Rendered image of the final cloth

B The pattern of the cloth in the finished scene

C Workflow from the pattern of the dress to retopology and final refinement



Back to basics



From garment pattern to stunning drapery

01 Study the interface

Marvelous Designer contains a 2D viewport on the right where we can create patterns and a 3D viewport on the left where all the simulation happens. On top of each window you'll find the relevant tools. On the far-right side is an Object Browser and beneath the Property Editor is where we define the kind of cloth for use. You may want to open Setting>Preference and go to View Control to set the controls to suit **D**.

02 Open an avatar

To get rid of the pre-made cloth just go to File>New. You can use the default avatar, but if you prefer to work with your own model go to File>Open>Avatar and select an OBJ file. Be careful to select the right scale. I will use one of my own female base meshes as the avatar. To adjust the Arrangement Points to the proportions and pose of your model, go to Avatar>Show Arrangement Bounding Volume. You can even create a complete custom set using the functions offered in the Arrangement Point tab of the Object Browser **E**.

03 Create a basic pattern

Start with the Create Polygon tool to create a simple shape for one side of the front section. Keep this simple or it will be quite time-consuming to get the pattern shape adjusted to your body. Copy it, Mirror-paste

it for the other side and repeat the process for the back pieces. Press the Sync button to update the 3D viewport and arrange your 2D pattern. Rather than creating your own design you can work with a real pattern. Import it as a Surface Texture to a Polygon and build your pattern on top **F**.

04 Refine the garment

First redefine the shape, add curvature to the seam lines and rebuild pieces to remove unwanted seams. Since the physical properties of the garment have a major impact on how the dress fits and folds, you will have to set these in the Property Editor. We'll use the Satin preset. Once done with the design we need to set the Skin Offset of the avatar in the Object Browser to 0, then lower the Particle Distance to boost the detail **G**.

Topology clean up

Marvelous Designer works with particles and when we export the geometry of the garment it will be 100 per cent triangulated. Even with a short particle distance, the surface will not be perfectly smooth. Most sculpting solutions will not be able to smooth out the triangulated meshes. I use 3D-Coat to create a quad-only topology. Instead of 3D-Coat you could use any other program that enables you to subdivide your retopology mesh and snap the new vertices to the surface of your reference mesh.

E Adjusting the bounding volumes of the arrangement points to the avatar's pose and proportions

F Creation and arrangement of the base pattern for a dress

G The dress, with the refined pattern and set properties active

H The simple trench coat pattern added

I The avatar posed with a Morph Target

J Front and back of the piece with wind simulation

L You can follow the chequered texture to create new topology

M The garment, partly smoothed in Mudbox



A wireframe shot of the particle mesh in the software

05 Add another layer

Because each layer of cloth affects the other, we want to have them all simulated in one scene. It's easier to dress the model using the Build in Layer system of Marvelous Designer. Create every garment in a single file and save it as a PAC file. Then add one after another, starting with underwear and re-simulating every time you add a new piece of garment to the scene (File>Open>Add Garment). For this scene we added a simple yet classic trench coat **H**.

06 Pose the avatar

To design the cloth of your character, it's best to work in a relaxed pose. To give your model a pose go to File>Import>OBJ and import your posed avatar model as a Morph Target. This way you get realistic folds based on the physical properties of the garment, gravity and the human body **I**.

07 Simulate wind

To give the whole character a more vivid feeling, we want to add a wind force to our simulation. Go to Environment>Show Wind then, when you have the Wind Helper selected, you will see the Wind

properties in the Property Editor. Just play around with the values and direction then simulate. The garment should always be sewn before adding wind **J**.

08 Import to 3D-Coat

The particle distance and the limitation set by our hardware to simulate them doesn't enable us to receive a smooth end result. To accomplish a smooth finish, and also be able to integrate the triangulated particle mesh into our pipeline, we'll use 3D-Coat to clean up. This will enable us to refine our garment mesh in ZBrush or Mudbox later on. It's best to do this piece by piece, deleting all the garment patterns, except for one. Go to File>Export>OBJ and make sure you have only the cloth shape selected, Welding and Unified UV Co-ordinates activated, and the right scale set **K**.

09 Retopologise

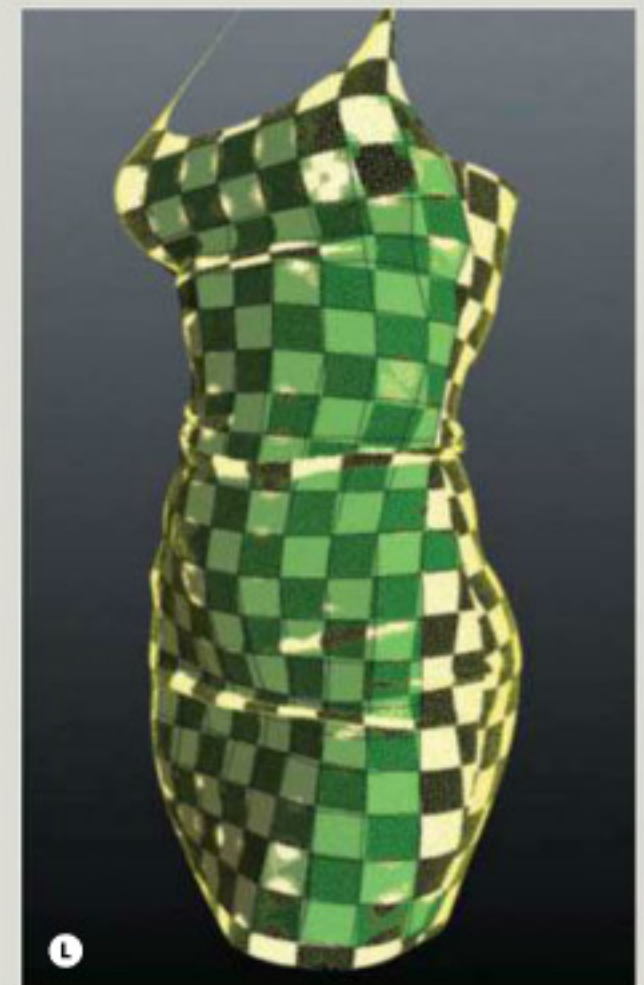
When you have imported the garment as a reference mesh from Marvelous Designer into 3D-Coat, start to build a very low but even and quad-only topology on top of the mesh. Since the garment has a perfect UV in the shape of the pattern it is built from, I like to add a chequered texture to the garment, which will be used as reference for the quad size **L**.

10 Subdivide and redefine

In the base mesh, you can generate a proper UV in 3D-Coat pretty quickly before starting to subdivide the retopologised mesh. Every time you subdivide, the retopologised mesh will be snapped to the surface of the reference mesh. This way you can transfer all the detail created in the simulation of the garment in Marvelous Designer to a workable quad-only topology.

Helpful hints

To get a proper idea of how the physical properties work, test them one by one. It's also helpful to have some reference to the kind of cloth you are aiming to create. If you want creases or specific folds, it helps to add inner shapes and lines to your patterns. Even small changes in the arrangement of the cloth can make a big difference. There is also a Pin and Drag function where you can influence the garment while being simulated.



When you subdivide, make sure every vertex is snapped onto the surface and not behind. If not, bring it into position manually to avoid any loss of quality. You can then rebuild Subdivision Levels in Mudbox or ZBrush and refine the garment **M**.

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MindTex

At a ridiculously low price, MindTex aims to compete with the top-end map generators

It's always exciting when new software suddenly pops out from nowhere, with MindTex being no exception. At its core this program generates Normal maps based on either Diffuse, Normal or Height maps, but it can also generate Height, Diffuse, Specular, Self-illumination and Ambient Occlusion maps all at the same time.

MindTex's clean interface is divided into three main sections plus a Preview window on the right-hand side. Large buttons clearly indicate how to import and export textures and all parameters are tweaked using sliders. These tweaks are immediately shown in the Preview window, either as 2D texture maps or as textured 3D models. Custom 3D models can also be imported into the 3D viewer, but most of the time the default models should do the trick. The 3D viewer also has some simple UV-offsetting tools, a triangle counter and a full-screen toggle, which gives the user more control over the final result.

Tweaking sliders is where most of your time will be spent and is a pretty straightforward process. Based on various detail levels, this is where you can decide what kinds of details should be pulled out of the imported map and into the newly generated ones. Here you will also find sliders to control the intensity of the generated maps, a Shape slider that tries to calculate depth from the imported texture and various other sliders that mostly deal with simple colour correction and noise.

Another handy feature of MindTex is the Batch Generate Utility. In short, this enables you to select a source folder for input



textures and a target folder where MindTex will put all of your generated textures. This feature sadly crashed the program on our computers, but once fixed this will surely be a great option in the future.

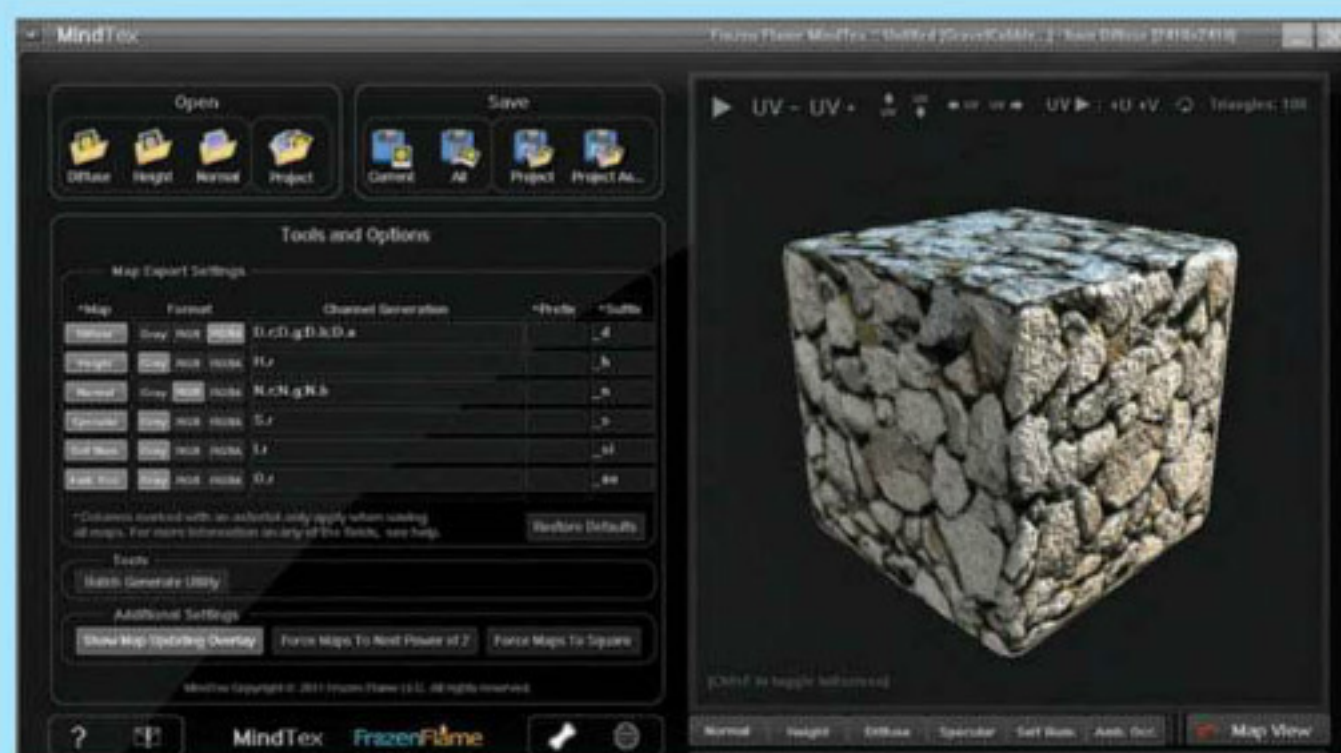
We found the overall quality of the texture maps generated was a slight let-down for MindTex – although considering it's the price of just a few pints, it certainly gets the job done for less.

Compared to similar programs out there, MindTex doesn't quite capture as much detail or depth as the competition (but remember it's \$15). After extensive tweaking of the sliders, most Normal maps turned out less detailed than expected. There is also no easy way to save presets at the moment; you can save projects which keep the presets, but a simple way to save slider presets would be a very welcome addition.

With a large feature set under the hood, MindTex's simplistic and easy-to-understand interface makes Normal map generation a breeze

MindTex's creator Ryan Berkani offers his feedback

- "You can save presets in the form of a project file, though I suppose that isn't as intuitive for some people as I'd hoped. An update is available now that should fix the batch-generation issue."
- "I haven't extensively observed MindTex's results at very high res [but] I will focus on this to see if I can improve the quality at [much] higher resolutions!"
- "MindTex [isn't] a replacement for sculpting and generating Normal maps from high-res sources – that will always produce the best and most accurate results. MindTex fills a support role in an art pipeline, providing a quick solution for certain tasks to save time and money."
- "I've already responded to several issues, released fixes for them relatively quickly and added new features in updates. I'm a one-man team right now [but] MindTex will continue to receive support and updates for the foreseeable future!"



Export settings give you control over your exported textures and the Batch Generate Utility should come in handy

Our verdict

Price: \$15 US*

<http://frozenflamecorp.com>

Features..... 7/10
Ease of use..... 8/10
Quality of results 6/10
Value for money 9/10

“A great tool, but it still has a way to go before it will compete with the best”

Final Score **8**/10

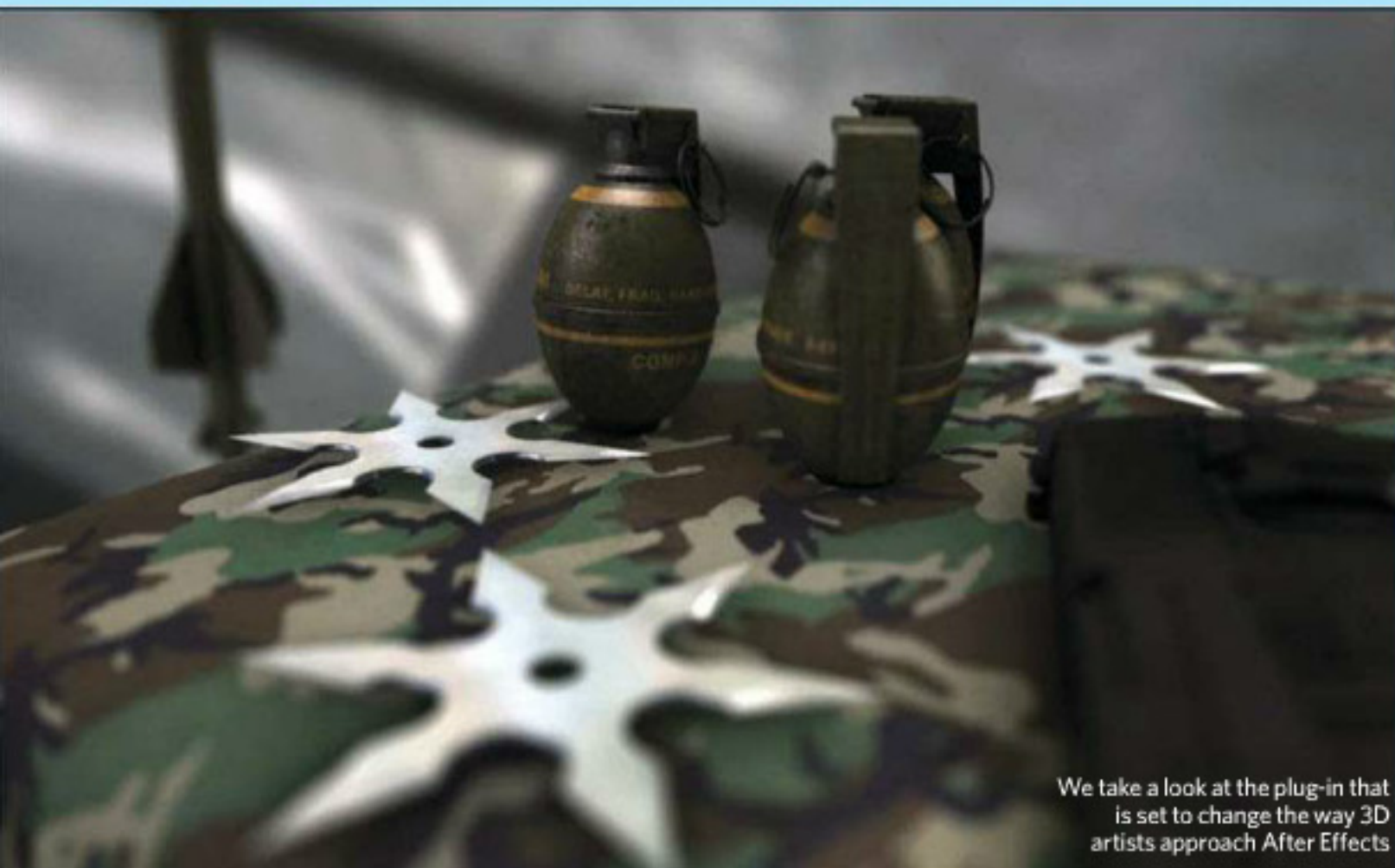
*We reviewed MindTex while it was on offer at \$15 US. It will eventually be full price at \$64.95 US

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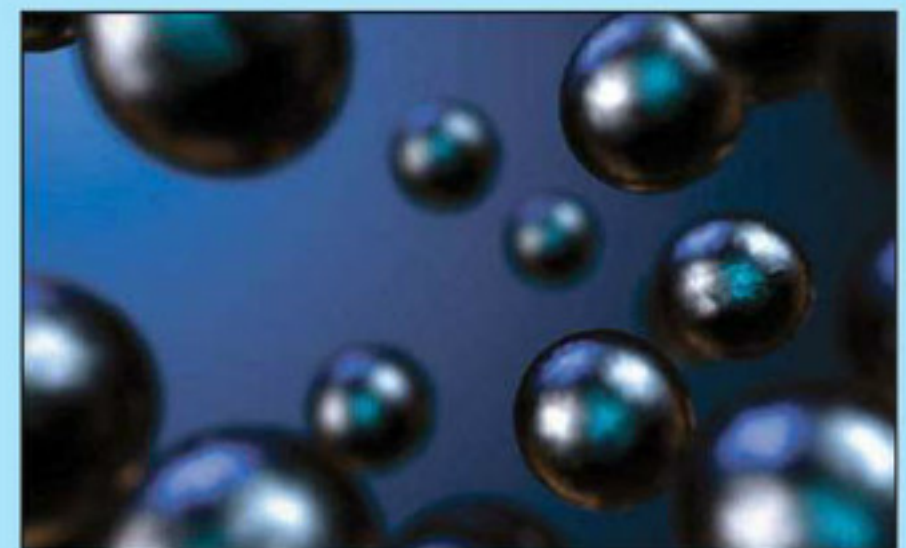
Andrew Kramer, leader of the Video Copilot team, has seemingly done the impossible by making After Effects into a legitimate piece of 3D software for a small price tag



We take a look at the plug-in that is set to change the way 3D artists approach After Effects



Andrew Kramer and his team have turned Adobe's software into a 3D powerhouse that is sure to change the creative workflow forever



The superb real-time ability will speed up any creative workflow, making for fast, reliable editing

This mind-blowing 3D plug-in from Video Copilot is probably going to change the workflow of 3D artists everywhere. Element 3D gives After Effects the ability to manipulate 3D objects, including the capacity to work with high-resolution models and textures, shading, lighting, ambient occlusion and even animation. The plug-in uses a fast OpenGL-based render engine that utilises a graphics cards, but has no requirement for high-end hardware. All the tests you see in this preview were completed on a small budget and the plug-in worked perfectly.

At first we couldn't believe we were rotating over 100k-polygon models, with 4k textures on them, in real time, and they were still looking amazing. Then we noticed it's because the plug-in doesn't complete any real raytracing and objects don't reflect one another. Unfortunately this is the trade-off made for the real-time this plug-in provides. What we found most impressive, putting 3D aside, is how well and swiftly depth of field, motion blur and fog is handled. You can rotate the camera around with all this active and still get almost real-time updates with incredibly good results. Anyone wanting to achieve quality in 3D software knows how much rendering time is spent on these results, so will be pleased with this plug-in's performance.

The plug-in has a particle array system that uses 3D models, so it gives you the ability to create superb CINEMA 4D-style motion-graphic animation inside After Effects. Plus it takes no time to render and any changes you make are in real time. With just a few keyframes inside Element 3D's Animation Engine you can get amazing results that until now were only possible in 3D software packages.

Element 3D includes lots of light presets that can speed up your work in most cases. If needed, though, it works great with After Effects' lights so you can get any kind of look you imagine. There are also around 20 shaders you have total control over, including Diffuse, Specular, Reflection, Bump and so on. There are also shader packs and textured model packs that can be purchased from the Video Copilot website.

Element 3D also gives you control over all the passes you could ever need for a good composite, so multi-pass rendering is not required and you can choose the pass you want to use from the dropdown menu.

This plug-in is a huge breakthrough for artists working in After Effects, especially those into motion graphics. Andrew Kramer and his team have started an avalanche of new ideas and possibilities for After Effects users to explore and enjoy with this fantastic new plug-in.

Our verdict

Price: \$150 US

www.videocopilot.net

Features 9/10

Ease of use 9/10

Quality of results 10/10

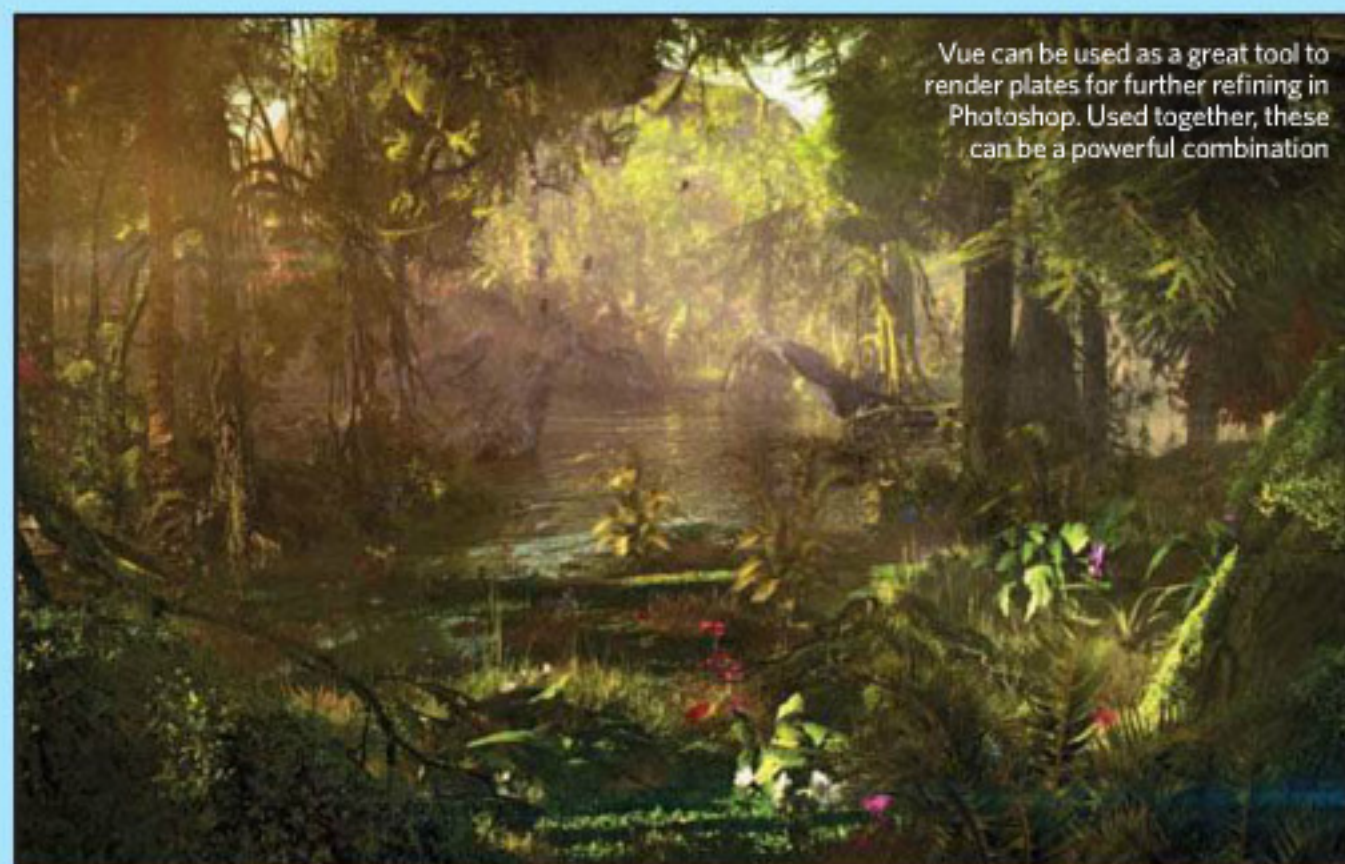
Value 10/10

“If you want to make awesome, realistic 3D quickly, then Element 3D is all you need!”

Final Score 9/10

Vue 10.5 Infinite

With continuous work on the software and newly added features, E-on Software's Vue 10.5 is now more powerful than ever before



Vue can be used as a great tool to render plates for further refining in Photoshop. Used together, these can be a powerful combination

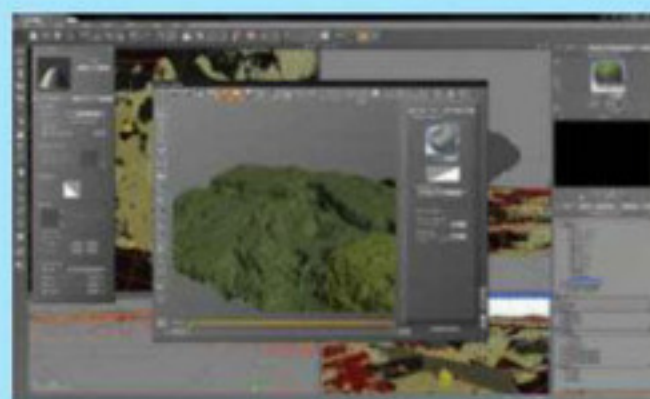
We've followed the development of Vue over the last couple of years and it's great to see how far the software has come.

Since Vue found its way into the arsenal of tools used by big VFX studios, E-on Software has been constantly working on optimising, refining and implementing new ways to create stunning and realistic landscapes and scenery. With the focus on creating environments that look as natural as possible, using trees, plants, terrain and rocks, it's also of course one of the main tools used in digital matte-painting.

The heart of Vue is the EcoSystem feature. This tool is responsible for creating forests and foliage for realistic-looking environments. Vue comes with a wide range of modifiable plant models that give a good starting point to create natural environments. Besides this you can also load objects of choice (OBJ, 3DS and many more) and create huge cityscapes as well.

EcoSystem now also has the ability to stack, which basically creates layers of objects. This can be a helpful procedure when creating realistic-looking close-up environment elements, like riverbeds covered with small stones for instance.

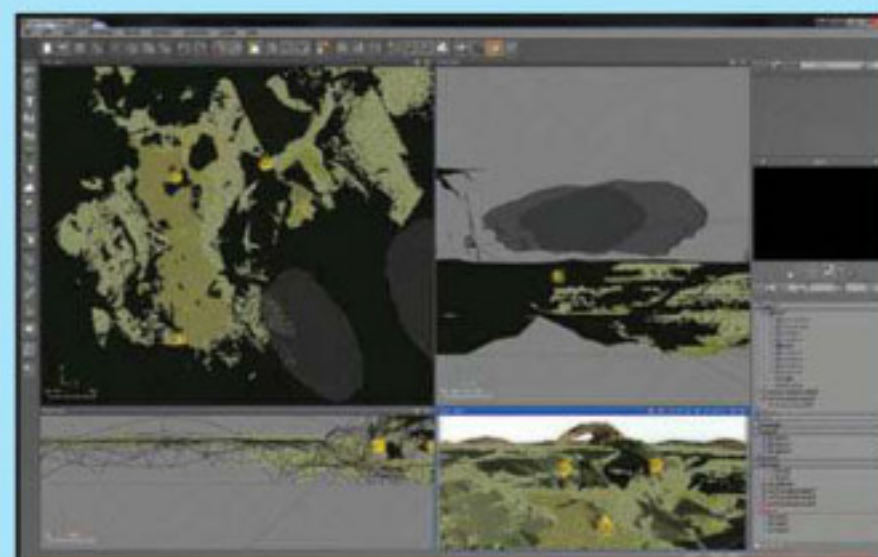
One of the most comforting enhancements is surely the Copy, Cut, Paste and Delete options for cameras. These can be time-savers when working on complex scenes that require two project files with the same camera setup.



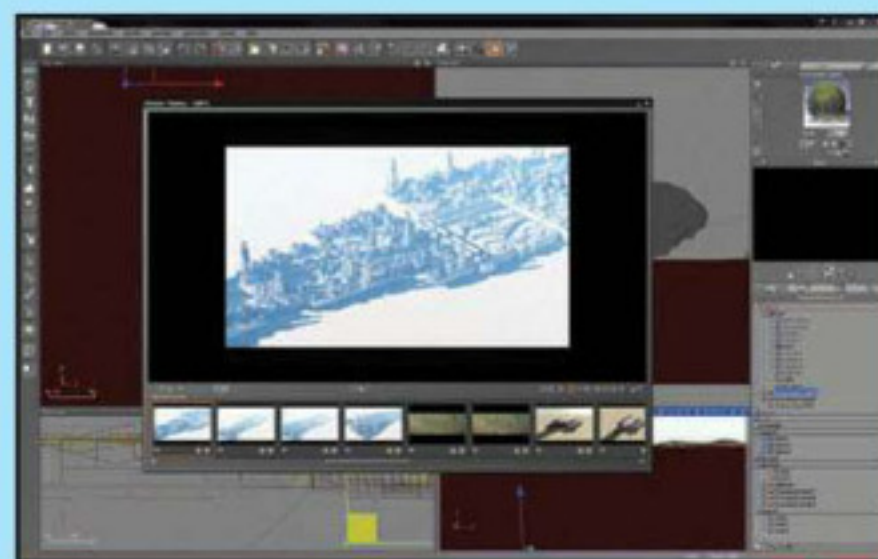
The Spline tool has received some very usable improvements too. Generally its intended use is creating roads or paths within a scene. The splines can also be used in combination with EcoSystem, which can create many neat possibilities when used creatively. Spline Roll now makes it possible to create a leaning effect for roads, much like roller-coaster rails. This again leads to lots of new creative possibilities. We can also see improvements within the Render Stack feature, which is a great tool for comparing test renders and playing around with post-process options.

With all of its features combined, we understand the reason why Vue has made it into the arsenal of many big studios. Like any other 3D software there are edges to Vue as well. The experienced user knows how to avoid crashes and knows the workarounds. Especially on heavy scenes, working with layers, and using the Show Only Objects From Active Layer option can make a dramatic difference.

Vue is a very versatile program, delivering great results – particularly in matte painting.



A node-based Function Editor gives you ultimate freedom when creating terrain and materials. This tool is explained within the PDF documentation



The easy-to-access interface setup is well known from other software packages and therefore easy for 3D veterans to work with

Our verdict

Price: \$995 US

www.e-onsoftware.com

Features..... 8/10

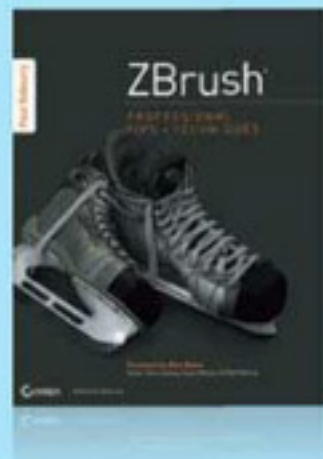
Ease of use..... 9/10

Quality of results 9/10

Value for money 9/10

“A wide range of optimisations and features make Vue 10.5 a great and affordable package”

Final Score 9/10



ZBrush: Professional Tips + Techniques

Offering insight acquired from one of Pixologic's top engineers, this book will help adept ZBrush users become even better with the software

The image on the cover says it all: two meticulously detailed ice skates, all the way from the laces that droop and fold down to the rutted lines of stitching and the gleam of the metal blades. This isn't a book that's concerned with using ZBrush for vague outlines or basic shapes; this is about the intricate details and getting the very most out of the software for shockingly impressive results.

Penned by Pixologic's lead 3D application engineer Paul Gaboury – the man who tells companies like Pixar, Disney and Weta Workshop how to best integrate ZBrush into their pipeline – *Professional Tips + Techniques* couldn't come from a more accomplished or capable tutor.

Exploring a range of underexploited tricks that may remain hidden to many within the depths of the software, this illustrated guide sheds light on the lesser-known aspects of ZBrush, offering version-neutral solutions



The book comes with an accompanying DVD that includes all the files required to complete the various projects described. These are also accessible through the publisher's website if you buy the Kindle edition

and shortcuts in areas such as sculpting, texturing, posing, rendering and more.

Although seemingly aimed at the more accomplished user, it's nevertheless a clear and accessible read, and you're bound to find many tips that will help improve the overall quality of your ZBrush sculpting experience.

Our verdict

Price: £34 / \$50 US

www.sybex.com

Quality..... 8/10

Ease of use..... 7/10

Value for money..... 7/10

Overall usefulness..... 9/10

“A thorough and helpful text to better your ZBrush skills”

Final Score **8**/10



BLAST: Spaceship Sketches and Renderings

A collection of spaceship designs and concepts to whet your creative appetite

The team behind *DRIVE*, consisting of artists Scott Robertson, Annis Naeem and Danny Gardner, has moved on from contemporary vehicle design, looking to the future and offering a collection of imaginative concepts that explore everything from intriguing flying vehicles to spectacular alien spaceships.

This beautifully presented book features sleek upright rockets, squid-like alien spacecraft, sprawling futuristic airports, angular hover pods and even a *TRON*-esque illuminated pilot.

Many of the final Photoshop creations are accompanied by several pages of sketches, showcasing the process of design with accompanying text. One craft, we're told, was inspired by a beautiful wooden sailboat; another by USB thumb drives.

It's a fun book to flick through, but perhaps more for aesthetic reasons than



There are dozens of gorgeous double-page spreads throughout the book, showcasing not just vehicle design but sci-fi backdrops too

educational ones. What you will definitely learn, however, is that iteration on your designs is key to a good end-product. Plus there's plenty of inspiration to glean from its many creative and detailed designs that will no doubt aid you when it comes to creating your own futuristic – and yet believable – vehicle designs.

Our verdict

Price: From \$25 US

www.designstudiopress.com

Quality..... 9/10

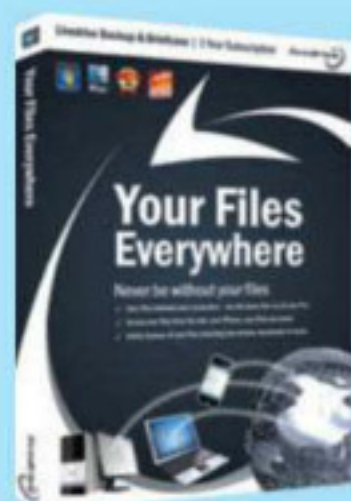
Ease of use..... 9/10

Overall usefulness..... 6/10

Value for money..... 8/10

“A great-looking book for the coffee table *and* the shelf”

Final Score **8**/10



Livedrive Pro Suite

This premium cloud storage service offers staggering amounts of space, user-friendly software and countless killer features



Livedrive is helpful in offering a mass of technical options to those who require them, while not being at all intrusive to use on a daily basis

Internet speed warning

Pick the best option for you

5TB of cloud storage is without question a vast amount. However, users with troublesome internet may wish to consider the merits of such a service and perhaps opt for one of Livedrive's lower-capacity and cheaper options if it better suits.



Stored music and videos can be streamed directly from Livedrive accounts via any standard web browser or via the Livedrive iPad/iPhone app

With increasingly faster broadband being continually rolled out across the UK, it's no wonder that people are beginning to live truly digital lives, synchronising every device and file effortlessly with remote storage servers.

While the concept of the cloud is very much part of an emerging market, there are already a good deal of cloud providers on the scene. These offer highly restrictive free accounts with a view to gaining fledgling clients and provoking them into upgrading out of convenience when quotas are met. This is where Livedrive steps in...

Livedrive is a premium, UK-based cloud service that offers staggering amounts of storage (5TB!) and countless innovative features that are ultimately and endlessly improved by a simple, concise and thoughtful user experience.

With most software, the magic doesn't manifest itself instantly, but Livedrive is a clear exception to this rule. We struggled to think of anywhere else you can find the ability to back up five devices to a single 5TB account and have it store up to 30 previous versions of each file. This offers the ultimate peace of mind for even the most backup-conscious of users.

The story certainly doesn't end there, though, with Livedrive offering account holders the ability to email files straight to a designated account email address for instant

storage. You can also stream entire music and video collections directly from a web browser, backup NAS drives, network devices and send photos automatically to social networking sites as and when they are uploaded. We also found a number of technical advantages of Livedrive over certain other services, such as the ability to control bandwidth usage and manage backups of multiple devices.

The process is also simple. Users log in to a web account after purchase, download the appropriate software for the operating system and establish which folders should be uploaded to the cloud and backed up alongside, defining a Briefcase folder. This acts as a remote storage location that's accessible from the desktop.

Once completed, you can have as much or as little interaction with the system as desired, adding mobile devices and up to five devices on a single account. Extra devices cost a comparatively insignificant 95 pence per month. Should a vast 5TB of Pro Suite storage not be enough, an extra terabyte can be purchased for £5 at the click of a button, making Livedrive a cost-effective and completely expandable solution for even the most demanding of users.

Livedrive isn't cheap by any estimation, but for the money it performs beautifully. It synchronises every aspect of the modern-day digital lifestyle effortlessly with nearly unlimited storage capacity.

Our verdict

Price: £150 per year / £14.95 per month

www.livedrive.com

Features..... 9/10
Ease of use..... 10/10
Reliability..... 9/10
Value for money..... 7/10

“Vast amounts of storage, excellent technical capabilities and a great UI make for a top outcome”

Final Score **9**/10

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Artist info



RenPeng Dong

Personal portfolio site
www.ldrhyne.cgsociety.org

Country China

Software used

3ds Max, Maya, ZBrush, Mudbox, Photoshop, V-Ray

“I saw an image on a website that was like a kind of transparent man blending with his background, which brought me this great idea... [I] decided to show the feeling of part drying paint, part real, part plaster”

Non-US readers turn to page 94

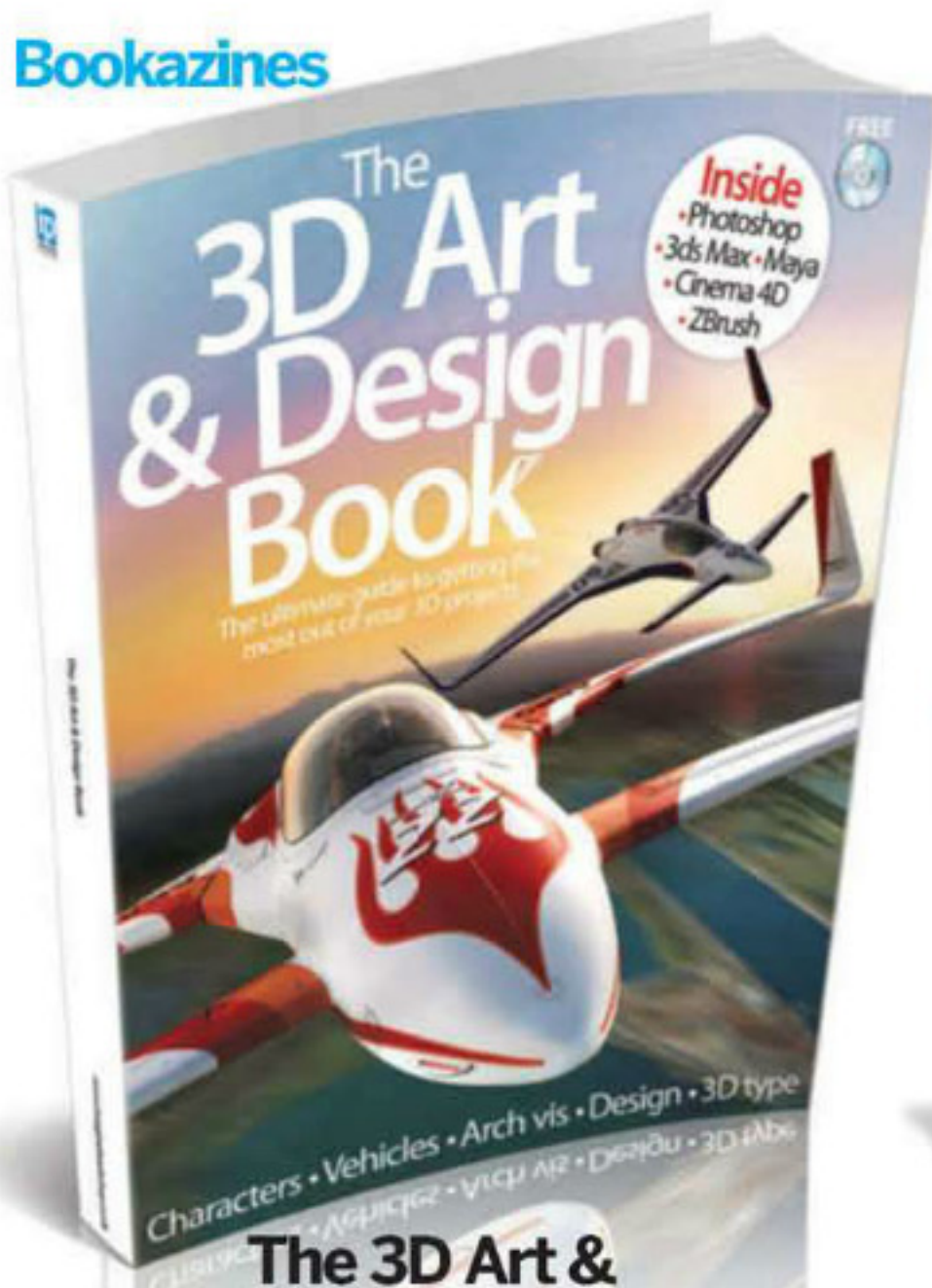
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Inside guide to industry news, studios, expert opinion and education

SIGGRAPH 2012
3D Artist visited the LA Convention Center to delve into the world of all things 3D at SIGGRAPH 2012. Read on to discover some of the new releases and announcements that took place at the show <http://s2012.siggraph.org>
Image © Colin McLaughlin
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Industry news

We report on the goings-on at the SIGGRAPH 2012 conference hosted in the sprawling LA Convention Center

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Up In The Sky

Arnaud Janvier and Antoine Robert discuss the dream-like wonderland they created for 77 Bombay Street's imaginative music video

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Hollywood production designer Sean Hargreaves reveals how he dreams up unique new worlds for the silver screen

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Visual Effects Production

Escape Studios could be the next step on your path to becoming a top VFX artist at one of the world's best studios

inside

“Together with Autodesk and Weta Digital, we have used the knowledge gained to develop the technology needed to streamline our workflow”

James Cameron discusses the next step in virtual production and how it will shape the way the *Avatar* sequel is created. Page 104

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Virtual production

Among the enlightening talks and discussions delivered at SIGGRAPH 2012, one that stood out was hosted by four-time Academy Award-winner and Weta Digital senior digital effects supervisor Joe Letteri, who discussed his extensive experience in virtual production over the years. Letteri explained that while the concept was pioneered by James Cameron for the creation of *Avatar*, its roots stretch as far back as the first *The Lord of the Rings* film. He spoke little of the future, but we hope to see exciting things from the next *Avatar* movie soon...



Autodesk, Lightstorm Entertainment and Weta Digital join forces

Cinema's leaders in virtual production collaborate with Autodesk on the upcoming *Avatar* sequels



A Autodesk's MotionBuilder 2013 has seen many enhancements. It now loads, saves and merges files much faster and is more closely linked to the editorial workflow

B James Cameron is a pioneer in the digital-production field, having codified the process in the creation of 2009's *Avatar*

Autodesk has joined forces with Weta Digital and James Cameron's Lightstorm Entertainment to further expand the virtual production workflows originally developed for *Avatar*, developing the technology in preparation for the production of the film's two highly anticipated sequels.

"Creating the virtual production pipeline on *Avatar* was a groundbreaking process that only enabled us to scratch the surface of what is possible," said James Cameron. "Together with Autodesk and Weta Digital, we have used the knowledge gained from this first experience to clearly define the ideal process and then develop the technology needed to streamline our workflow. With the resulting pipeline, on the *Avatar* sequels, I will be able to devote more of my

energy to the creative side of the moviemaking process, and dig deeper into all that is possible with virtual production."

According to Joe Letteri, senior digital effects supervisor at Weta Digital, after completing *Avatar* the three companies had a far clearer understanding of the development requirements to make the process more efficient. "We knew that by bringing the whole digital pipeline in line with the traditional on-set style of shooting, we could open up brand-new ways for directors like Jim to make their films," Letteri explained. "When we're charting new territory like this, it's invaluable to have a partner like Autodesk whose tools are the platform and the standard in the industry."

As part of the Autodesk Entertainment Creation Suite 2013, the new virtual production enhancements will help studios of all sizes adopt this revolutionary moviemaking process. MotionBuilder promises a quicker and easier filmmaking process, enabling faster takes and more flexible editing. A new HD SDI video output support will enable directors and camera operators to gain more accurate real-time feedback on their virtual camera work. *Avatar*'s first sequel is due for release in 2015.

“When we’re charting new territory like this, it’s invaluable to have a partner like Autodesk whose tools are the platform and the standard in the industry”

Joe Letteri, senior digital effects supervisor, Weta Digital

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We take a look at some of the new releases announced during SIGGRAPH 2012

New releases



MARI 1.5

The Foundry has updated its 3D texturing tool MARI. New features include overlapping UV support, the ability to cast real-time shadows from multiple light sources plus a Maya texture export ability.



LightWave 11.5

LightWave 11.5 features Genoma, a new modular instant-rigging system. It can quickly rig a simple biped or quadruped ready for animation without the need for specialised rigging tools.



CINEMA 4D Release 14

MAXON's latest update to CINEMA 4D features dynamic sculpting tools, improved rendering options and a new Camera Calibrator that can match a 3D camera image to a 3D environment.



ZBrush 4R4

Pixologic's latest update to its digital sculpting software features Insert Multi Mesh brushes, a Tri Part Multi Mesh option, QRemesher Alpha, a new Undo history function, plus so much more.

New tools



M5 Pro Series

The Plextor M5 Pro Series is a new performance line of solid state discs due to launch in September. The SSDs can handle extremely high loads, making them suitable for use in heavy-duty roles.



NVIDIA Quadro line

The Quadro professional mobile GPUs, based on Kepler architecture, are the most powerful yet offered, with at least double the number of NVIDIA CUDA cores on previous generations.



Dell Precision workstations

Dell has announced the next generation of its Dell Precision mobile workstations, the M4700 and M6700, the most powerful machines of their size. To learn more visit <http://tinyurl.com/3dartistdell>.



NVIDIA Maximus

NVIDIA has also announced the second generation of its workstation platform, NVIDIA Maximus, which will again feature Kepler architecture. The Maximus platform is slated for a November release.

Software shorts

Bringing you the lowdown on top product updates and launches

LumenRT 3 A new version to help you Convert architectural designs into real-time environments. Find out more at www.lumenrt.com.

LuSt Luxion has released the world's first interactive, 3D-rendering, web-service platform. Visit www.keyshot.com/lust.

KeyShotVR Provides interactive, touch-enabled viewing of 3D content over the web on any device. Learn more at www.keyshot.com/vr.

3ds Max extension Augments the power of the Particle Flow system for Subscription customers. Visit <http://tinyurl.com/3dsmax-ext>.

Maya 2013 extension New DX11Shader and Scene Assembly tools for Subscription users. <http://tinyurl.com/maya-ext>.

Enlighten A new upgrade of the next-gen lighting technology for game engines has been released by Geomerics. Visit www.geomerics.com.

Golaem Crowd 2.0 Featuring a 15x performance increase plus a host of new features. Discover more at <http://tinyurl.com/golaem20>.

3DEqualizer4 Release 2

The upgrade to Science.D.Visions' match-moving software. Head to www.3dequalizer.com for info.

Plug-ins

A wide selection of plug-ins were launched at SIGGRAPH this year – we've whittled down some of the biggest...

Xsens released the MVN Live plug-in for Maya 2013, which greatly speeds up the animation process, enabling animators to create and retarget animations quickly and in real-time.

With the release of Smith Micro Software's Service Release 3, a significant update to Poser 9 and Poser Pro 2012, comes a new GoZ plug-in for ZBrush.

Thinkbox Software unveiled Ember, the new plug-in for 3ds Max offering a set of tools for creating, loading and processing volumetric data in the form of fields, voxel grids and point clouds.

Imagination Technologies also revealed the Caustic Visualizer, an interactive ray-traced viewport plug-in for 3ds Max and Maya that makes ray-traced, photorealistic rendering an integral part of the content-creation workflow.

A look to the future

Changes to RenderMan

The Pixar RenderMan User Group met at SIGGRAPH to watch the Pixar team lay out the upcoming roadmap for future iterations of the ever-popular rendering software. Gold mastering on RenderMan Studio 4 and RenderMan Pro Server 17 is planned for the end of September, to be followed by a series of rolling releases, with 17.1 landing around 1 November.

RenderMan Pro Server 17 features include increased memory saving plus multiple avenues for variation and object instancing (already available with renderers such as Arnold).

A demonstration was shown with a single tree built and used to populate a forest of 76,227. The instancing created it in just 284MB!



3D printing

A 3D-printed exoskeleton has helped a child finally lift her arms and play

Using a Dimension 3D Printer, researchers at the Alfred I. duPont Hospital for Children in Philadelphia have been able to help four-year-old Emma Lavelle overcome the limitations of a congenital disorder.

Using 3D printing, researchers created a custom, lightweight robotic exoskeleton that enabled Emma to conquer greatly limited joint mobility and underdeveloped muscles. Without 3D printing, such medical advancements would remain inaccessible or unaffordable to many.



More Houdini for less

Side Effects Software rebrands and lowers the price of Houdini

Houdini

Modeling
 Character
 Animation
 Lighting
 Rendering
 Compositing

HoudiniFX

Modeling
 Character
 Animation
 Lighting
 Rendering
 Compositing

Particles
 Rigid Bodies
 Pyro FX
 Fluids
 Cloth
 Wire

\$1,995 INCLUDES AUP **SAVE 30%**

\$4,495 INCLUDES AUP **SAVE 50%**

Houdini FX and Houdini also support integration with Side Effects Software's newly Orbolt Smart 3D Asset Store

Side Effects Software made several key announcements at SIGGRAPH 2012, starting with the rebranding of its flagship product Houdini Master as Houdini FX. The original features can still be found in the FX version, with the focus on particles, fluids, Pyro FX,

cloth, wire and rigid-body dynamics. What was Houdini Escape is now simply Houdini.

There was also a significant price drop: while Houdini remains at \$1,994 US, Houdini FX has dropped in by \$2,000 US, available now for just \$4,495. Visit www.sidefx.com.

New ways to organise your 3D resources

Asset management solutions become prominent at SIGGRAPH

SIGGRAPH 2012 saw Shotgun Software announce Tank, a new asset management solution designed to support rapid and constant pipeline evolution while automating a studio's file-based workflow. Tank is built on top of the Shotgun production-tracking platform alongside Revolver, its all-in-one review and approval toolset.

We also saw several render management announcements, including Qube! from PipelineFX and Deadline 6.0 from Thinkbox Software. A new plug-in for Deadline from Thinkbox Software was also announced to help automate some common deliverables.



Various render management systems were introduced at SIGGRAPH 2012 including Qube! and Deadline 6.0

Poser releases new models

New male model Tyler GND joins a much-improved Miki 4



The fourth edition of Poser's most popular 3D figure Miki is planned for a September release, along with the introduction of the new male model, Tyler GND.

Miki 4 is a completely re-sculpted body morph of Miki 3 with Poser's powerful Vertex Weight Mapping for superior bending and posing, and subsurface scattering for photorealistic skin. Miki 4 is Poser Face Room-compatible, includes abundant advanced body controls for faster posing, plus an extensive set of facial expressions to choose from.

Tyler GND, the latest addition to the Poser family of figures, has been artistically sculpted from head to toe, transforming Poser 9 and Poser Pro 2012's Ryan 2 into a chiselled athlete with extra muscular, tendon, bone and vein details. Visit <http://poser.smithmicro.com>.

Project Focus

Up In The Sky
music video

We speak to the talents behind this psychedelic, pastel-infused animation



Project 77 Bombay Street - *Up In The Sky*

Description Arnaud Janvier and Antoine Robert were brought together by Cube to create an enticing animated video for 77 Bombay Street's *Up In The Sky*. Combining a love for Sixties' culture with the iconography of the band's history led the pair to create a sun-dappled psychedelic journey through a Swiss dreamworld. The Beatles would be proud!

Client Freedomia Entertainment
Country France

Software 3ds Max, Photoshop, After Effects

Company Cube is a 2D and 3D animation and digital special effects company located in Paris, France. Founded in 2002, the company's work has covered a great many formats over the years, spanning commercials, films for theme parks and hit children's TV series like *Kaeloo* for Canal+.

Website www.cube-creative.fr



Arnaud Janvier
Director



Antoine Robert
Director

Created for the Swiss band 77 Bombay Street, this music video for the catchy track *Up In The Sky* turns four musicians into papercraft figures that explore a sun-kissed forest. The dreamlike place is home to bulbous flowers that sprout mushroom-headed pixies, an assortment of flying animals, and even a flying VW camper van.

Arnaud Janvier and Antoine Robert were the two directors drafted in to bring this vision to life at the Parisian company Cube. "We had no brief from the band," says Robert. "The producer only had one condition to satisfy: the four members of the band had to figure in the clip."

The pair set about sending the band back to their favourite era. "I personally love Sixties' culture and the psyche era, so it felt like a great opportunity to put a lot of amazing stuff in the video," says Robert. "I like the psychedelic sequence in particular; it may look more like a media player screensaver than the small tribute to *2001: A Space Odyssey* I wanted, but it's a small victory nevertheless!"

The pair used 3ds Max and After Effects to achieve the *Sgt. Pepper*-esque look. "We separated our diffuses and lights on several passes with an LPM plug-in, which we could transfer to After Effects and modify anything we wanted, such as a character's skin, clothes, lights, shadows and so on," explains Robert. "The advantage was that it was in 3D/2D, so the render times were very fast and we could re-work our images wherever necessary."

"We put in as much 2D as possible and used cheap 3D that could work with it," continues Robert. "To give the impression the image was packed with action we used a lot of small moving forms like squares, circles and triangles that we added in post-production."

“I personally love Sixties' culture and the psyche era so it felt like a great opportunity to put a lot of amazing stuff in”

Antoine Robert, co-director

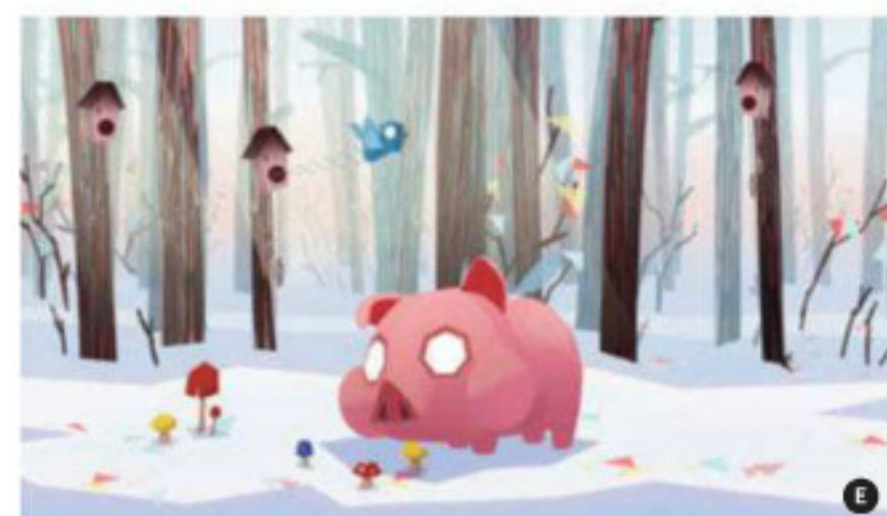
A "The principal musical influence was from the Beatles, which explains the psychedelic quality and vivid colours!" says Janvier

B Originally the four brothers of the band had different coloured skins, and eyes without pupils, but this was changed due to the characters feeling too much like puppets...

C "We wanted the video to represent the band and reference their origins," says co-director Janvier. "That's why you'll see a Swiss chalet [and] cuckoo clocks"

D *Up In The Sky* is a gorgeous video, making great use of shapes, pastel colours and lighting, while demonstrating a stunning blend of 2D and 3D animation

E Robert and Janvier have both worked with various artists at Cube, including "genius in animation and co-director on the French TV series *Kaeloo*" Antoine Rota and artistic director Tristan Michel



Industry insider Hollywood designs

Production designer and concept artist

Sean Hargreaves discusses the impact 3D has had on a career that has seen him work with the likes of Spielberg, Fincher and Scott



About the insider

Job Production designer and concept artist

Location Los Angeles, US

Education Art Center College of Design, Pasadena: Bachelor of Science in Industrial Design

Website
www.seanhargreavesdesigns.blogspot.com

Biography Sean was born in Blackpool, England and moved to the US aged 13. Upon graduating, he worked at the General Motors Advanced Concepts Centre. He soon moved into film, storyboarding, concept art, art direction and then production design. He's worked with Steven Spielberg, Ridley Scott and David Fincher at companies like ILM, Digital Domain and Rhythm & Hues

From set design and construction through to make-up and lighting, production design is a role that demands a multi-skilled approach.

Production designers are not only responsible for establishing the look and tone of a project, but for convincing audiences that these places are real – they're not just building sets, they're building worlds.

Production designer Sean Hargreaves has amassed an impressive portfolio of work, from conceiving the macabre world of David Fincher's *Seven* through to conceiving and building the impressive glass mansion of *Thirteen Ghosts*. For him, the introduction of 3D has been an invaluable tool in the field. Rather than sketching the same incredibly complex designs from multiple angles, 3D enables production designers to enter the virtual versions of the worlds they are creating, enabling them to better visualise and impart their ideas to film directors and crew.

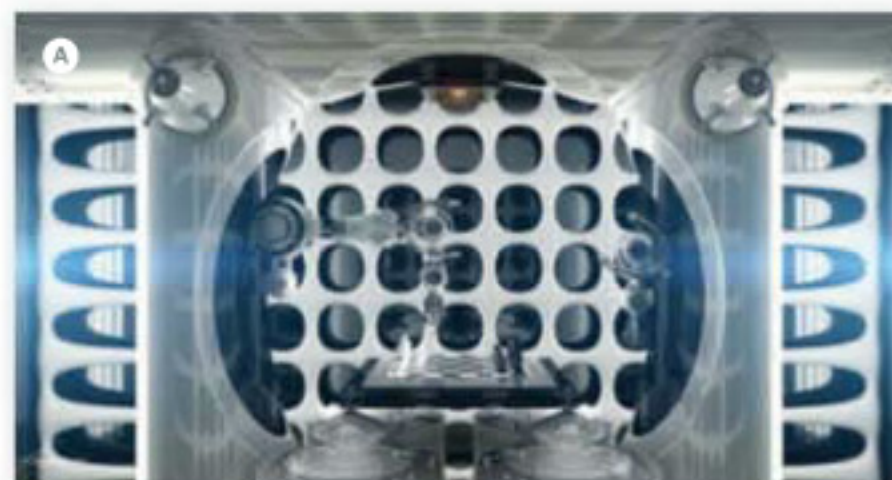
We caught up with Hargreaves to discuss the impact of 3D and to find out about a career that has stretched from designing cars to designing for Hollywood.

What exactly is production design and what kind of process does it involve?

A production designer oversees the look of a project, be it a film, commercial, animation, game and so on. For example, in a film he/she works with the director and director of photography on the visual feel of the film, such as lighting, colour, architecture and how these work with the story and shots of the film.

How many different styles/genres of film has your work covered?

I've done horror, science fiction, present day and period films, so I've covered a lot of genres. When you design for the entertainment field you are designing relative to a story and how the shots are laid out. You aren't just designing, as there are many, many factors involved in the final look of a film. A considerable amount of research is undertaken prior and during a production; you literally have to become a sort of historian in some genres and a futurist in others.



How is 3D being used in production design today?

3D has become the norm for many productions' art departments, especially effects-heavy ones, as 3D files are now used by concept artists and can be passed to digital set designers and post effects houses. This is extremely important and useful as it cuts down on misinterpretation of the design. Directors see this tool as incredibly useful to their vision and it has helped tremendously in terms of working in conjunction with practical set builds.

You've used LightWave a lot in recent years. How does it benefit your work?

I needed an in-the-box solution, meaning I wanted a software package that was affordable to me at the time and let me freely design and render without the hassle of third-party plug-ins. Rendering was extremely important to me, as I wanted the ability to render photorealistic images [to make] my images appear as real as possible. LightWave has always been known for its native renderer. Working in 3D helped me build a design and render it from three to four different views [with] the option to do fly-throughs. The key to design is to be as clear as possible and this is what LightWave has helped me show.



PLACES

In Hargreaves' first book, *PLACES*, he presents a variety of concepts and finished pieces from his portfolio. It's available right now from Amazon and Design Studio Press. He is currently working on his second book



Recent projects that Sean Hargreaves has worked on include:

2011 *PLACES* – his book of personal designs, from Design Studio Press
2011-2012 *Percy Jackson: Sea of Monsters, The Bourne Legacy, Big Miracle* – concept design and matte painting
2000 *Thirteen Ghosts* – production designer
2000 *The Cell* – concept artist
1998-2001 Production design for

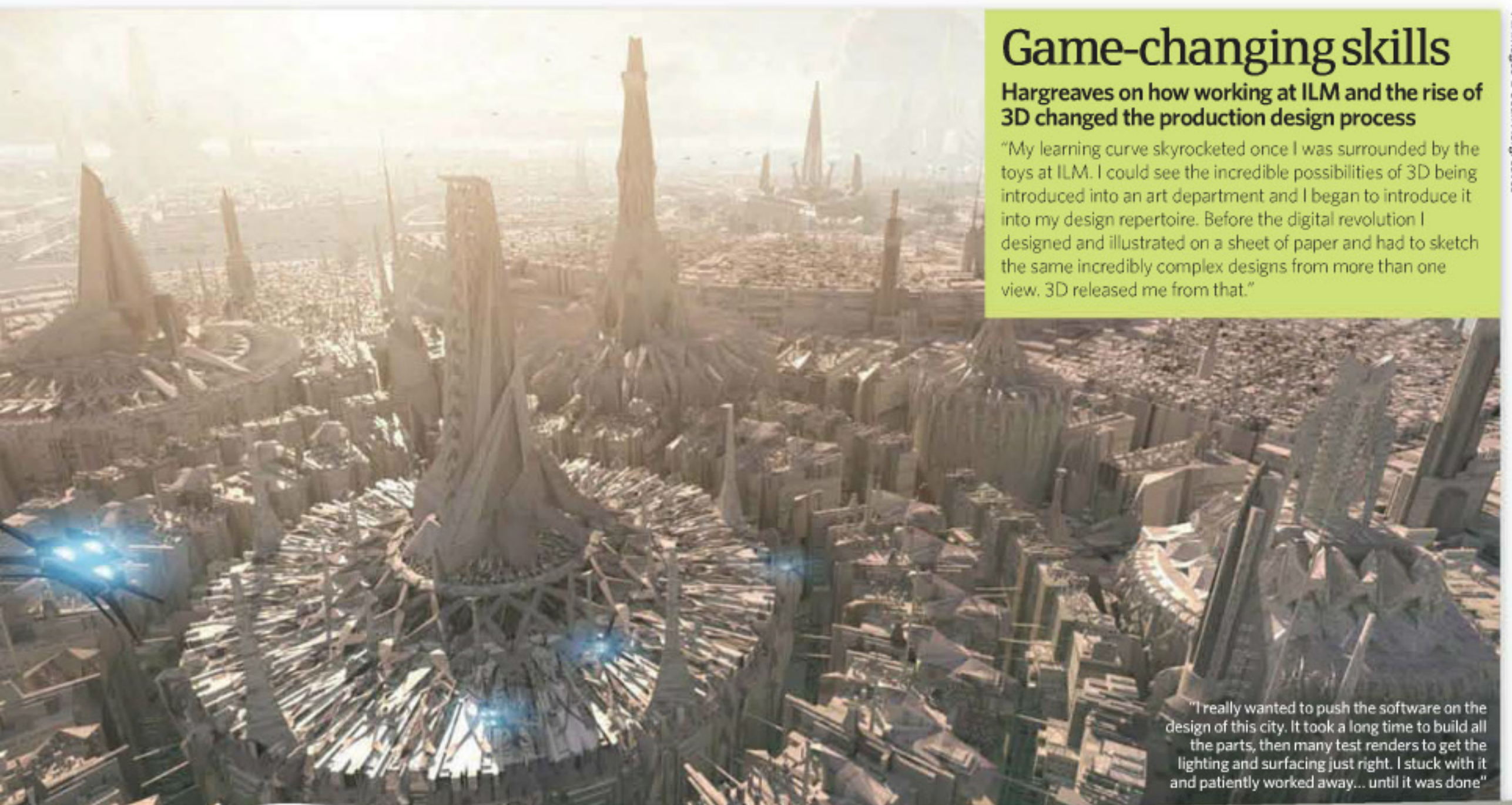
Industrial Light and Magic
1995-present Music Videos for Michael Jackson, Nine Inch Nails and Moby
1997 Assistant art direction and concept design on *The Lost World: Jurassic Park*
1995 *Heat* – concept artist
1995 *Seven* – concept artist

Game-changing skills

Hargreaves on how working at ILM and the rise of 3D changed the production design process

"My learning curve skyrocketed once I was surrounded by the toys at ILM. I could see the incredible possibilities of 3D being introduced into an art department and I began to introduce it into my design repertoire. Before the digital revolution I designed and illustrated on a sheet of paper and had to sketch the same incredibly complex designs from more than one view. 3D released me from that."

"I really wanted to push the software on the design of this city. It took a long time to build all the parts, then many test renders to get the lighting and surfacing just right. I stuck with it and patiently worked away... until it was done"



“Working in 3D helped me build a design and render it from three to four different views [with] the option to do fly-throughs”

A Hargreaves says: "I like clean rooms, such as those you see in labs. I also like complicated machines designed to do simple tasks. Here I've combined [them] both"

B "My parents and wife have always recognised my talent and supported me greatly. I've always made an effort to work on great projects with talented people"

C "It's been quite a journey to come from a small town in [the north of] England and then work with such amazing directors whose films I saw as a child, and work at incredible companies"

D "Here I wanted to design a room that was familiar yet different. Is it the past or the future? It could be either," Hargreaves says of this illustration

E "I designed this robot as a reaction to all the box-type robots with weapons I keep seeing... I wanted to do something more exotic with glass parts... almost with a swimmer's [shape]"



+ The best courses and freshest talent from around the globe...

Visual Effects Production

Can Escape Studios help make you the next Hollywood VFX star?

Based in Shepherd's Bush, London, the Escape Studios VFX Academy sits amid one of the most thriving hubs of CG activity in the world today. Ranging from small start-ups to all-out international powerhouses such as The Mill, MPC and Double Negative, Escape Studios is only ever a short tube ride from some of the most prominent and creative studios around. What better place to start an education in the business?

Escape Studio's Visual Effects Production program is a full-time 12-week course – it's no university degree, but then it doesn't pretend to be. There are no theoretical exercises and you're not spending years musing over a broad series of subjects. This is a focused, streamlined, practical and VFX-heavy program that teaches exactly what you need to know in extreme depth over a very short time. It's intensive, hands-on and workshop-led, specifically designed to give students the experience and, somewhat importantly, the showreel that will help them secure the jobs they want in visual effects.

Taught by talented industry veterans (find out more at www.escapestudios.co.uk/3d-artist-tutors), the Visual Effects Production program starts with basic concepts, with students learning how to use industry-standard tools that cover modelling, texturing, lighting, tracking, effects, compositing and rendering. In a final project, designed to showcase their new-found skills, students then take their created VFX elements and combine them with live-action footage to build a seamless, photorealistic sequence.

The course is mainly classroom-based, but students wishing to study online can learn each 3D package step by step on the web through Escape Studios' Online Academy, complete with personal help from an expert Escape Studios tutor alongside live online chat and content sharing with students.



The creative space

Escape Studios is located in Shepherd's Bush just 15 minutes from Soho, London's VFX hub. Its state-of-the-art training facility mirrors a real CG studio down to the last detail, from the architectural design to its top-of-the-range computer equipment. An inspirational creative space where students can study, chat, relax and feel at home, this is an environment where budding CG artists can develop skills among like-minded peers.

“An Escapee benefits from the decades of industry practise and years of curriculum fine-tuning that Escape Studios provides”

Gideon Corby, VFX tutor

To get a feel for what it's like to study with Escape Studios, you can visit one of the academy's open days, which are organised regularly throughout the year. Students can meet the team, check out the facilities and even see a class in progress. A one-on-one consultation with a training advisor will also help put you on the right track. To book a place, head to www.escapestudios.co.uk/open-days.

If you like what you see and decide to take the Visual Effects Production course you'll need talent, personal and financial commitment, imagination, hard work and belief. So if you think you have this and more, Escape Studios can give you the knowledge and tools to prove it. Launch your career into an exciting new realm. It can all begin here.



A Escape support continues beyond the end of the course, with students awarded 12 months' free access to a variety of exclusive online courses in Maya, NUKE, MatchMover and a great deal more

B Escape Studios is ten this year and to celebrate it's holding the UK's first ever VFX festival. It currently has golden tickets for the festival to give away – for more information head to www.escapestudios.com/goldenticket

ESCAPE STUDIOS

Program details

Name Visual Effects Production
Length 12 weeks
Website www.escapestudios.co.uk/visual-effects-production-courses
Fees £9,975
Entry requirements Previous experience using a Windows PC or Mac as well as a good understanding of spoken English

focus

STUDENT GALLERY

Escapees reveal some of their final projects, including plenty of CG integration into filmed footage – plus one example of physics simulation from Escape's VFX Professional course...



Gun on desk

» **Tajinder Singh**
"By combining various elements I believe I've captured the aged look and feel I was hoping for," says Singh



Student talk



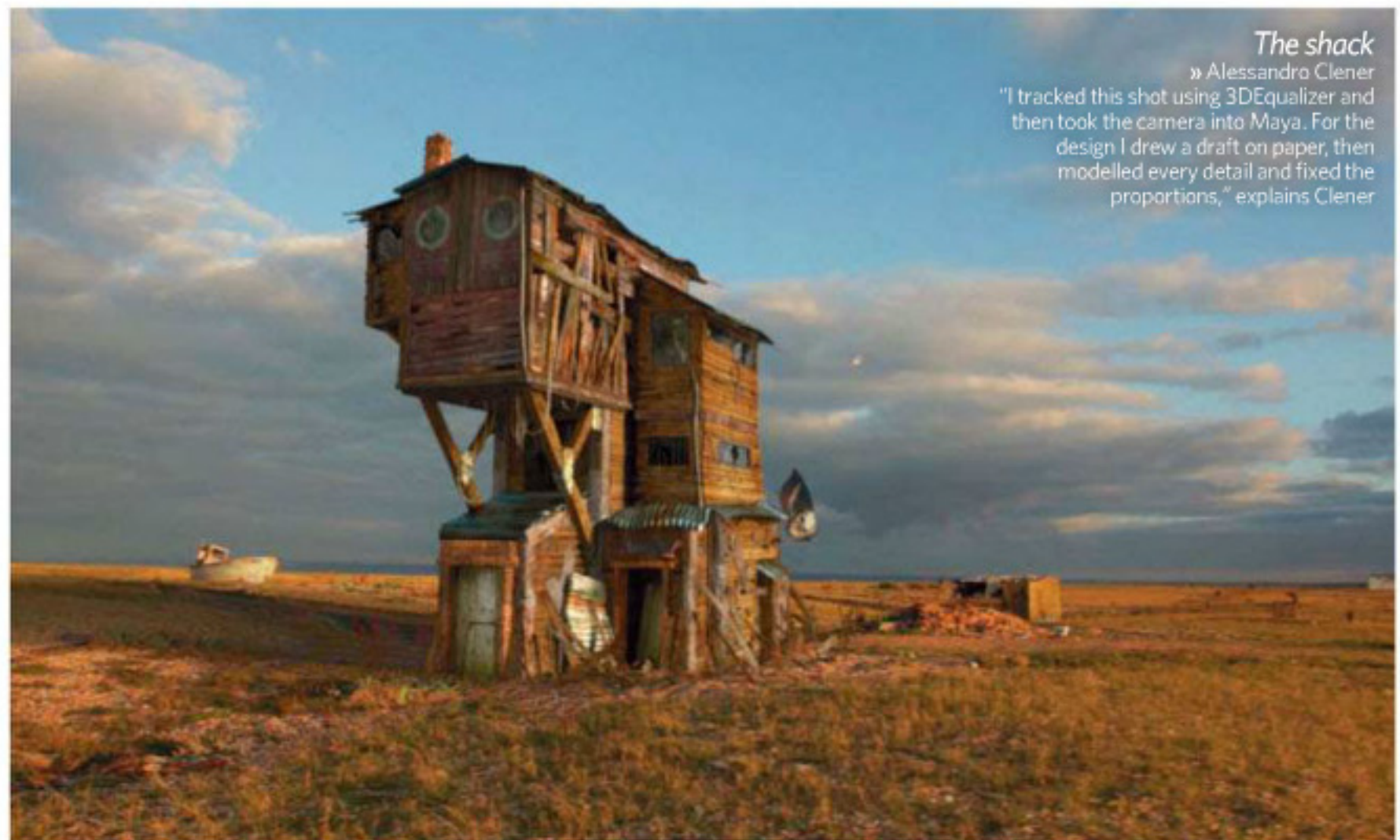
We talk with Alessandro Clener, a student on the Visual Effects Production Course and the artist behind *The Shack*.

Can you describe the culture and location of the campus?

Escape Studios offers one of the most complete courses for VFX in London. Don't forget that London is one of the key centres for VFX worldwide! The best of the best, I think. At Escape Studios I found very competent people; the tutors who have already established a career in the industry of special effects, and the rest of the team working there were pleasant and helpful. At Escape Studios I found everything I needed to start my career and I'm really happy for that.

What has the course taught you?

The course is quite comprehensive, as it offers a strong foundation to approach the world of production. Technically the course starts from scratch, giving you the foundations for modelling, texturing, lighting and rendering in the first six weeks. At the end of these initial weeks we have a still image we can present. From this point the class starts to learn the integration of CG with filmed footage. All the steps from the first six weeks are implemented but more advanced. We are also introduced to other programs such as Mudbox, and ZBrush. By the end of the course we already have two shots to be included in our showreel.



The shack

» **Alessandro Clener**
"I tracked this shot using 3DEqualizer and then took the camera into Maya. For the design I drew a draft on paper, then modelled every detail and fixed the proportions," explains Clener



C Old-style bicycle

» **Marco Marsili**

"This project was modelled using Maya, rendered in a layer pass with mental ray... and composited in Photoshop. I captured the wall picture with my reflex camera," explains Marsili of his subtle yet effective piece

D 2012 destruction

» **Frank Mingbo Li**

Frank Mingbo Li explains: "Following the 12-week VFX Production course, I took the next step [with the] VFX Professional Program to learn simulation. In this project my goal was to re-create the film effects of 2012"

E Singer sewing machine

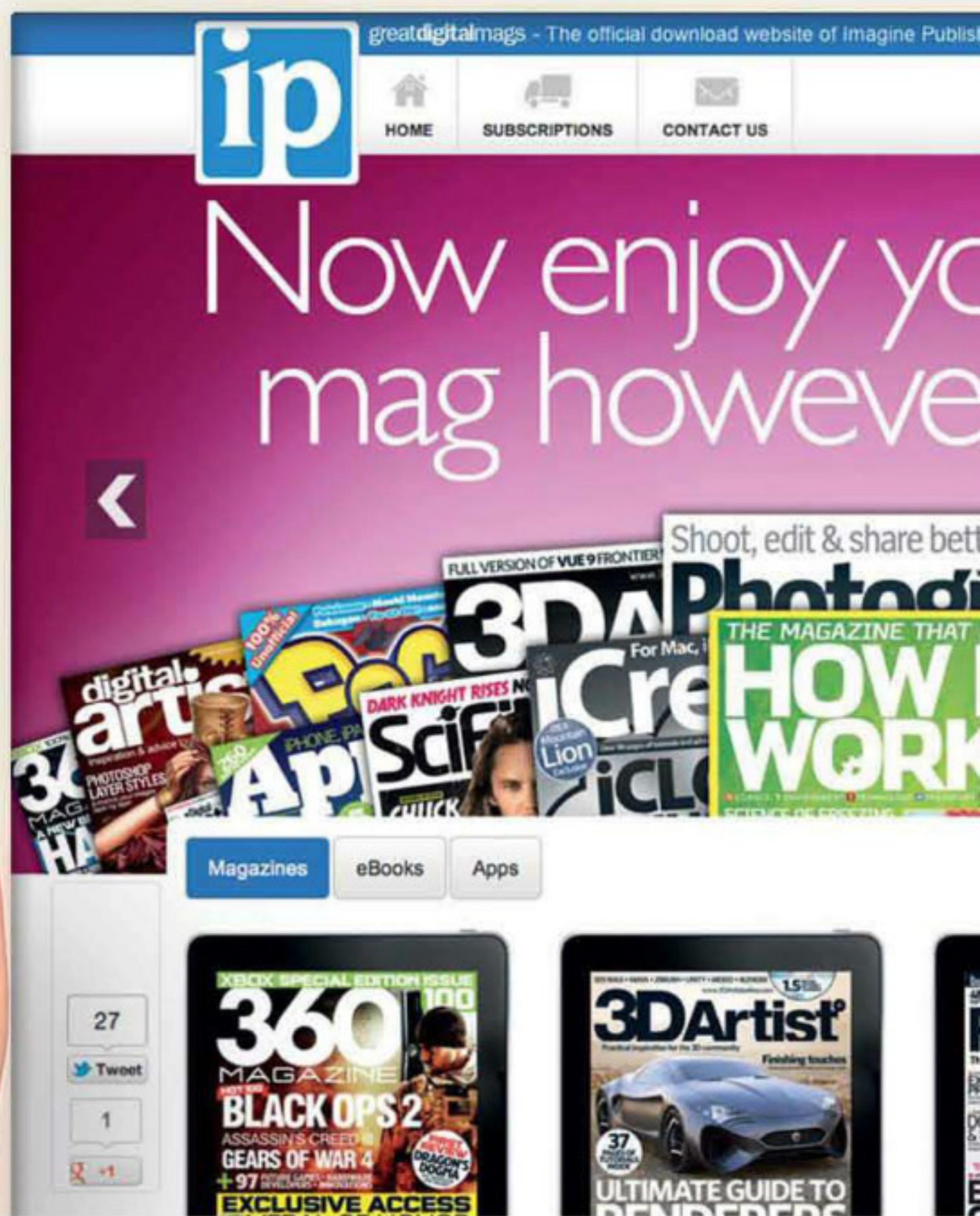
» **Pieter Vandenhouwe**

"The challenging part of this project was getting the shader of the main body to look right, and the decals. Because of the glossy surface none of the reference images were usable," Vandenhouwe says

F The windmill

» **Jose Slon**

Slon explains: "This was my final project after the 12-week course. The footage was tracked using 3DEqualizer, and the model made with Maya. Textures were done with Photoshop and the final compositing in NUKE"



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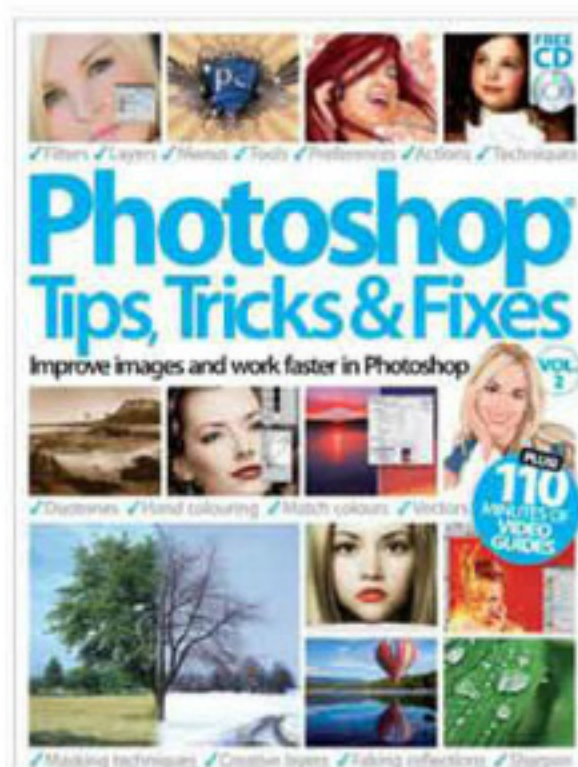
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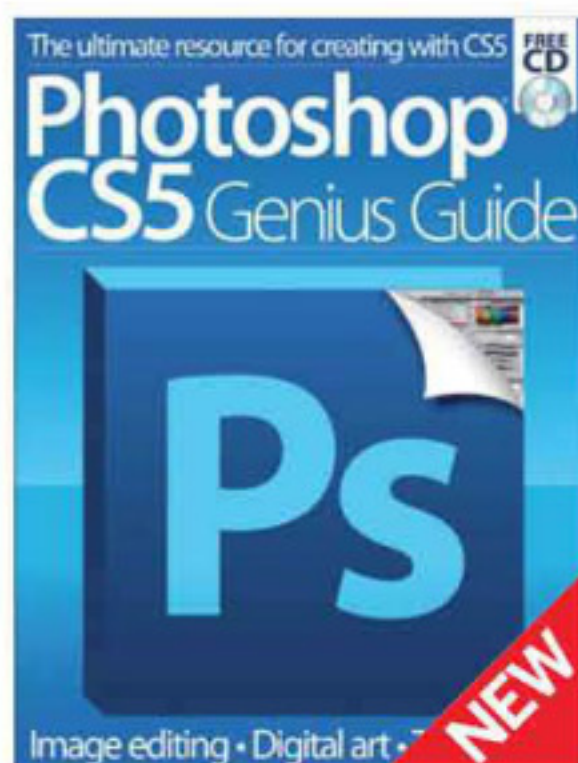
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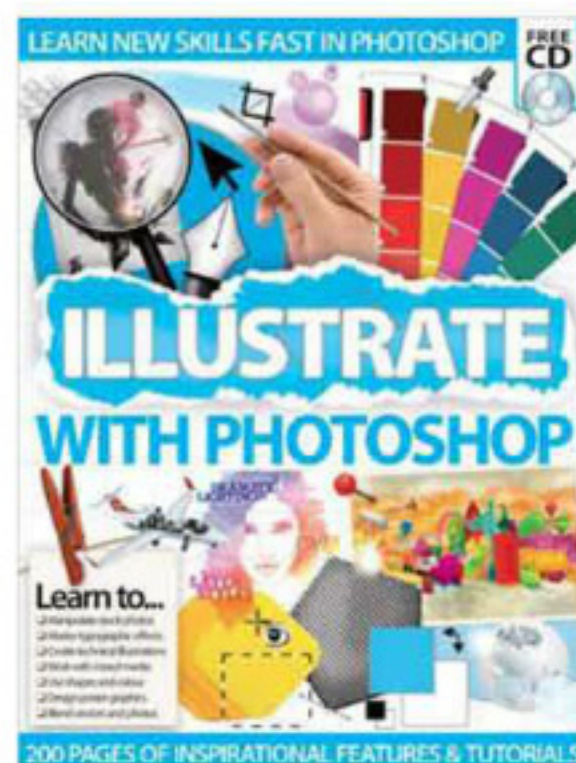
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James McDonald

Student at the DAVE School

James, how long were you at the DAVE school before you created this sculpture?

"This was modeled and textured in my first 10 weeks of training here at the school."

What do you like best about the school?

"The thing that I like best about the school is the range of real world work experience you get. In the time that I have been here, I have worked on 3 separate real world productions. This is experience that would be very difficult to come across without the DAVE school."

What are some key skills you have learned at the DAVE school that let you create such a beautiful model?

"The main skill that the DAVE school taught me, which I used to create this model was the Lightwave to ZBrush pipeline. Skills like being able to easily model and UV the object in Lightwave then send it to ZBrush for sculpting, texturing and map generation, then back to Lightwave for lighting and rendering. Learning all this ensured that the model was delivered at the highest quality and within the deadline."

